CMT 330

Three-Knife Trimmer Installation and Operator's Manual

The Challenge Machinery Company
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SERIAL No.: _____

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1 Introduction

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Introduction

The introduction section of this manual is intended to provide installers and operators with basic information. Safety recommendations are made, and machine options and specifications are listed.

1.1 Warranty Information

READ THIS MANUAL BEFORE OPERATING! Follow all precautions and instructions. For parts and service contact the Authorized Challenge Dealer from whom the machine was purchased. Always give the **SERIAL NUMBER** and **MODEL** of your machine to ensure the correct parts are sent.

RECORD YOUR MACHINE SERIAL NUMBER in the space provided on the front cover of this manual. Fill in the warranty card accompanying this manual and return it **DIRECTLY TO CHALLENGE.**

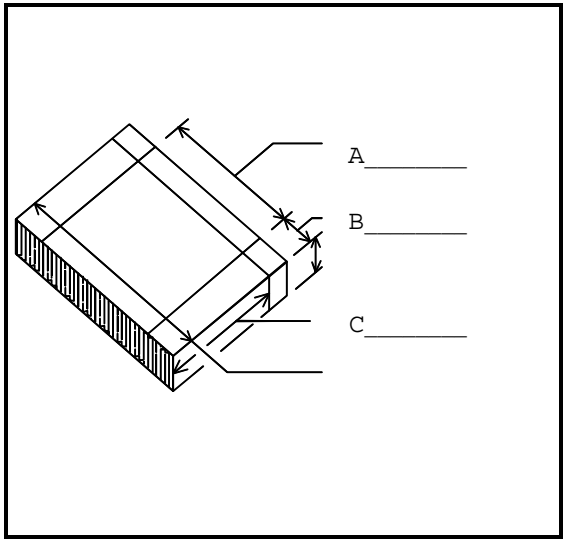
If you bought a used machine, it is important to have the following information on record at Challenge. Copy this page, fill in the information and send it care of The Challenge Service Department, 6125 Norton Center Drive • Norton Shores • MI 49441.

* WARRANTY INFORMATION *

PLEASE REVIEW THE ENCLOSED WARRANTY INFORMATION SHEET

It is very important that you read and understand the conditions outlined in the *Warranty Information Sheet* attached to the outside of the shipping container of your machine. The *Warranty Information Sheet* must be filled out completely and returned to **THE CHALLENGE MACHINERY COMPANY** in order for the warranty to be issued for this machine.

The letters in the following diagram correspond to the accuracy adjustment values listed in the Installation Information table at the right.



* INSTALLATION INFORMATION *

Model: **CMT 330**

Serial No.:

Company Name:

Address:

City:

State/Province:

ZIP Code

Phone No.:

Date Installed:

Dealer Name:

Dealer City:

Accuracy Adjustment Values	
A=	**inches**
B=	**inches**
C=	**inches**

1.2 Warning Label Definitions

Warning labels are posted throughout the machine to indicate areas where physical injury may occur.

Read the instruction manual.
The instruction manual should be read and understood before operating this machine.

Do not operate with more than one person!
One person only should operate this machine at a time.

Cut / Crush Hazard!
Do not operate with covers removed.
Do not disable safety devices.

Crush Hazard!
Do not operate with covers removed.
Do not disable safety devices.

Crush / Entanglement Hazard!
Do not operate with covers or guards removed.

Electrical Shock Hazard!
Disconnect power before removing cover.

Electrical Shock Hazard!
Disconnect power before removing cover.

1.3 Note Definitions

The formats of three specific types of notes found throughout this manual indicate the level of danger or importance associated with the task presented. The format of warning notes, caution notes, and regular notes imply a certain level of danger. The following examples give a description. Associate the text format with its level of danger or importance.

Warning Definition:

WARNING

A warning indicates an operating or maintenance procedure, practice, or condition that, if not strictly observed, could result in injury or loss of life.

Caution Definition:

CAUTION

A Caution indicates an operating or maintenance procedure, practice, or condition that, if not strictly observed could result in damage to, or destruction of, equipment.

Note Definition:

Note: A regular note indicates an operating or maintenance procedure, practice, or condition that is necessary to accomplish a task efficiently.

1.4 Safety

Before installing or operating any equipment, it is important to take precautions. Read and thoroughly understand the safety precautions outlined below.

- This machine is designed for one-person operation. Never operate the machine with more than one person.
- Safe use of this machine is the responsibility of the operator. Use good judgment and common sense when working with and around the machine and its accessories.
- Read and understand all instructions thoroughly before using the machine. If questions remain, contact your Authorized Challenge Dealer. Failure to understand the operating instructions may result in personal injury.
- Only trained and authorized individuals should operate this machine.
- Only trained and authorized service technicians should service this machine.
- Do not alter safety guards or devices. They are there for your protection. Severe laceration or dismemberment may result if safety devices are altered.
- Disconnect power and lock out before performing any maintenance. See Section 1.5 , Power Lockout Procedure.
- Observe all caution and instruction labels on this machine.
- Be extremely careful when handling and changing knives. Severe lacerations or dismemberment could result from careless handling procedures.
- Perform the Safety Systems Check given on page 4-9 before each shift begins.

- Keep all conveyors and elevator accessories clear of foreign objects. Do not manually place foreign objects within the machine. Cutting anything other than qualifying perfect bound books could result in serious damage to the machine and create safety hazards. A qualifying perfect bound book will fall into the size range described in the specifications on page 1-8.
- Make sure all applicable accessories are securely bolted to the main machine. Tip hazards may result from unsecured accessories.
- If the machine operates abnormally, consult a Challenge authorized service agent.

1.5 Power Lockout Procedure

For maximum safety while making ADJUSTMENTS or REPAIRS to your machine, lock out the main power disconnect switch. The switch should be moved to the OFF position and a padlock securely fastened through the loop. The person adjusting or servicing the machine should hold the key.

Figure 1-1. Main Power Disconnect

1.6 Packing List

Compare the contents of the crate against the following lists and the packing slip to be sure all items are included with your shipment.

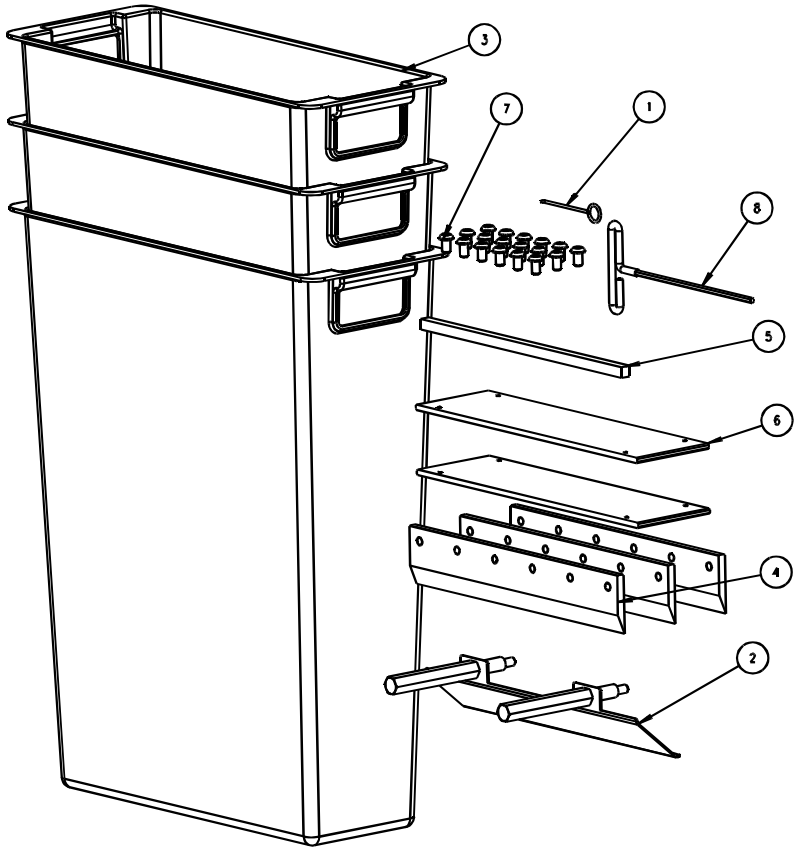
1.6.1 Basic Machine/Options

This parts list includes the basic machine and any accessories that may have been ordered with the machine.

Part Number	Description	Qty.
CMC-330	CMT 330 Basic Machine	1
	Accessory Options	
In-line Option 1	In-line (shown above)	
56401	In-feed Conveyor	1
56421	Cooling Elevator	1
In-line Option 2	In-line with Tilt In-feed Conveyor	
56600	Tilt In-feed Conveyor	1
56421	Cooling Elevator	1
Stand-alone Option	Stand Alone	
56416	Hand-feed Conveyor	1
Exit Option	Fixed (shown above)	
56420	Exit Conveyor	1

1.6.2 Standard Accessories

The following list contains pre-installed, standard accessories for the CMT 330.



Item	Part Number	Description	Qty.
1	5064	Cut Stick Puller	1
2	56028	Knife Lifter	1
3	56143	Waste Bin	3
4	56246	Knife (scabbard not shown)	6
5	56303	Cut Stick	1
6	56304	Cut Plate	2
7	H-6910-605	Knife Bolt- 3/8-16 x 5/8 BHCS	18
8	W-180	7/32" T-Handle Hex Wrench	1

1.6.3 Consumables

The CMT 330 uses the following consumable items.

Part	Description	Qty.	Frequency
E-967-1	LAMP	6	10,000 hrs
56527-4700	UHMW TAPE (TABLE)	2	1 yr.
56523-1000	UHMW TAPE (JOG)	2	1 yr.
SU-30-103	GREASE (EXT. PRESS.)	BULK	1 wk.
SU-30-104	GREASE (RYKOTAC EP)	BULK	each knife change
56228	FACE PAD	1	6 mo.
56181	LEFT CLAMP PAD	1	6 mo.
56181-1	RIGHT CLAMP PAD	1	6 mo.
56178	CENTER PAD	1	6 mo.
56246	KNIVES (SET OF 3)	1	5000 books
56303	CUT STICK	1	rot. 1000, change 8000 books
56304	CUT PLATE	2	rot. 1000, change 4000 books

The following consumables are found in **Oil Change Kit, K-56040**.

Part	Description	Qty.	Frequency
56041	FILTER ELEMENT (AIR)	1	1 yr.
H-227-1	FILTER ELEMENT (OIL)	1	1 yr.
S-1991-3	GRADE 46 HYD. FLUID	1	1 yr.

1.7 Specifications

WARNING

The CMT 330 was designed specifically for use with the Challenge in-feed and exit accessories listed in this table. If any other accessories are used, it is the purchaser's responsibility to comply with *ANSI B65.4 Safety Standard for Three-knife Trimmers.* Failure to comply with this standard could result in personal injury or death.

CAUTION

The CMT 330 was specifically designed to trim perfect bound books only. *It should not be used for trimming other materials. Trimming other materials with the CMT 330 may result in safety hazards or damage to the machine.*

For trimmable book sizes, see section 1.7.1 .

NOTE: Challenge reserves the right to make changes to any product or specification without notice and without incurring responsibility to existing units.

Description	US Units	Metric Units
Perfect bound books only		
Start book (max.)	9.5 x 12.5 in.	241 x 317.5 mm
Start book (min. bottom cover)	6.75 x 7	171.4 x 177.8 mm
Finish book (min.)	4.125 x 5.875 in.	104.8 x 149.2 mm
Face trim (max.)	5.5 in.	140mm
Book thickness range	0.048-2.000 in.	1.22-50.8 mm
Minimum Trim	0.125 in.	3.2 mm
CMT 330 Basic Machine		
Width	34.5 in.	876 mm
Depth	84 in.	2134 mm
Height	61 in	1549 mm
Net Weight	2540 lb.	1140 kg
Shipping Weight	2850 lb.	1300 kg
Floor Loading	60 PSI	414 kPa
Waste Bin Capacity	3 @ 14.75 gal. per bin	3 @ 55.8 L per bin
Oil Capacity	5 gal.	19 L
Air Consumption	5 CFM @ 80 PSI	142 LPM @ 5.5 Bar
Knife Re-grind	1/4 in.	6.4 mm
60 Hz Requirements	208/230 V, 25 A, 3 phase	
50 Hz Requirements	380/415 V, 10 kW, 3 phase, 12 A	
Memory	99 jobs	
Time to change book size	15 sec.	
Throughput	up to 400 books/hr.	
56401 Basic In-feed Conveyor		
Depth	12.14 in.	308.4 mm
Width	35.4 in.	876 mm
Height	17.5 in.	445 mm
56420 Exit Conveyor		
Depth	12.14 in.	308.4 mm
Width	47 in.	1194 mm
Height	39.5 in.	1003 mm
56421 Cooling Elevator		
Depth	21.5 in.	546 mm
Width	37.03 in.	941 mm
Height	45.5 in.	1156 mm
56600 Tilt In-feed Conveyor		
Depth	28.62 in.	727 mm
Width	39.38 in.	1000 mm
Height	26 in.	660 mm
Mates w/ binder exit heights	17.5-25.5 in.	445-648 mm

1.7.1 Book Size Chart

Figure 1-3 can be used to determine if a specific book layout can be trimmed using the CMT 330. From Figure 1-2, see that (**x**) is the bottom trim and (**h**) is the height of the book. The book size must fall within the shaded region of the chart but never exactly on the sloped line.

The CMT 330 software will not allow a book to be cut outside this range. The operator should be aware of these size constraints before books are printed. The CMT 330 will not allow only one top or bottom edge to be trimmed.

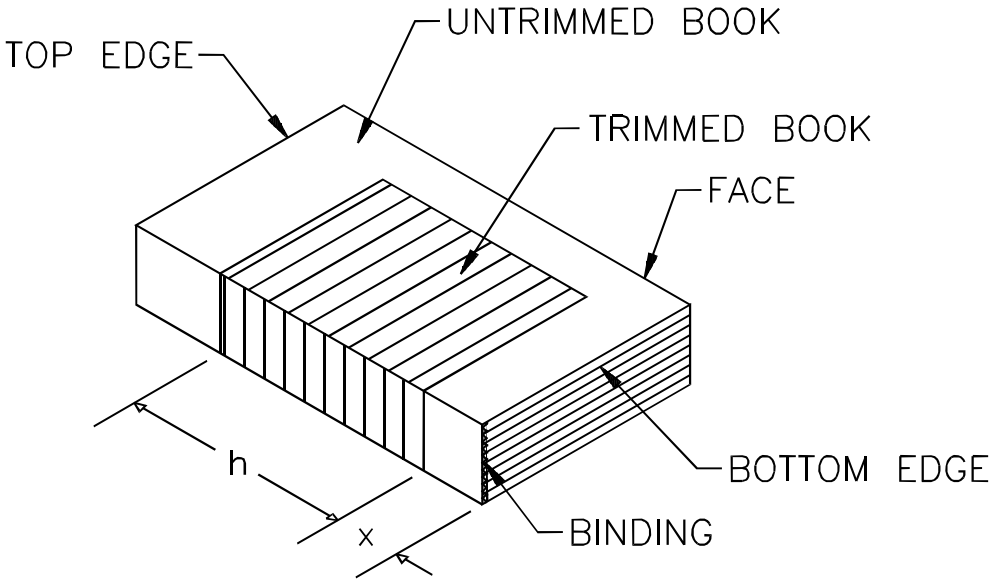


Figure 1-2. Book Terminology

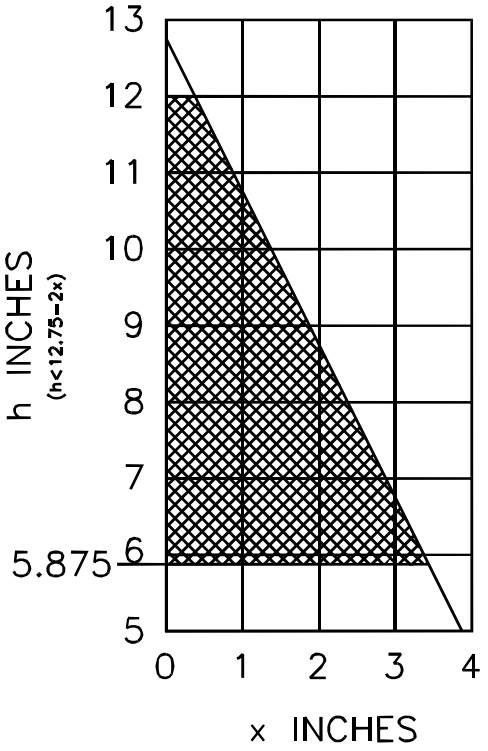


Figure 1-3. Trimmable Book Sizes

1.8 General Locations

Become familiar with general machine locations. This manual frequently refers to these locations. In order to understand the instructions presented, it is necessary to have a working knowledge of machine locations.

Note: The word "rear" refers to the general direction closer to the back end of the machine. "Back" refers only to the backside of the machine.

1.8.1 Front Views

The front views shown in Figure 1-4 and Figure 1-5 locate the front, back, right, and left sides of the machine. Remember these references while reading instructions in this manual. Refer back to these figures as necessary.

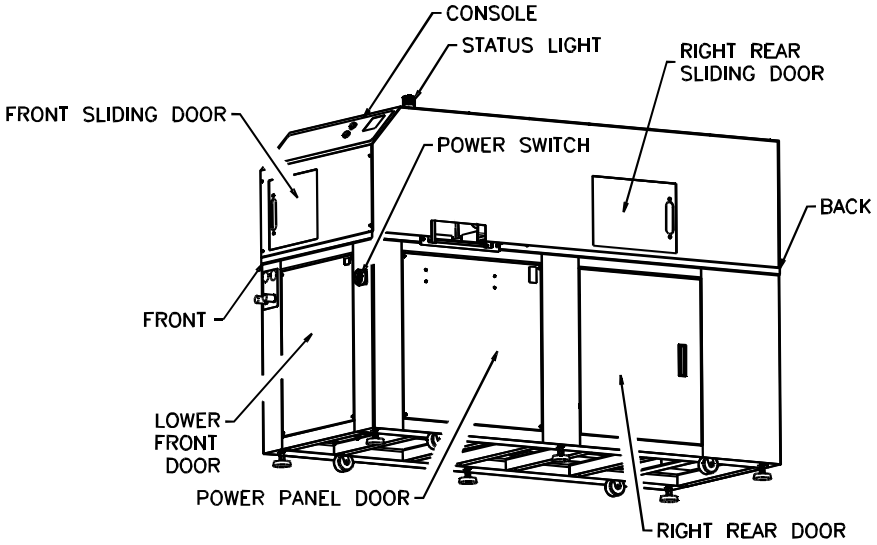


Figure 1-4. Right Front View

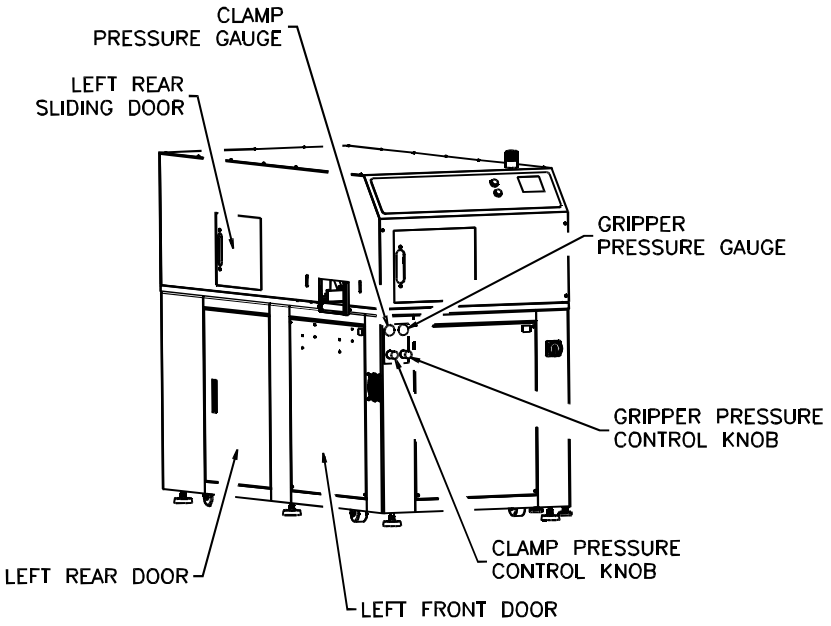


Figure 1-5. Left Front View

1.8.2 Back View

Important locations at the back of the machine are shown in Figure 1-6.

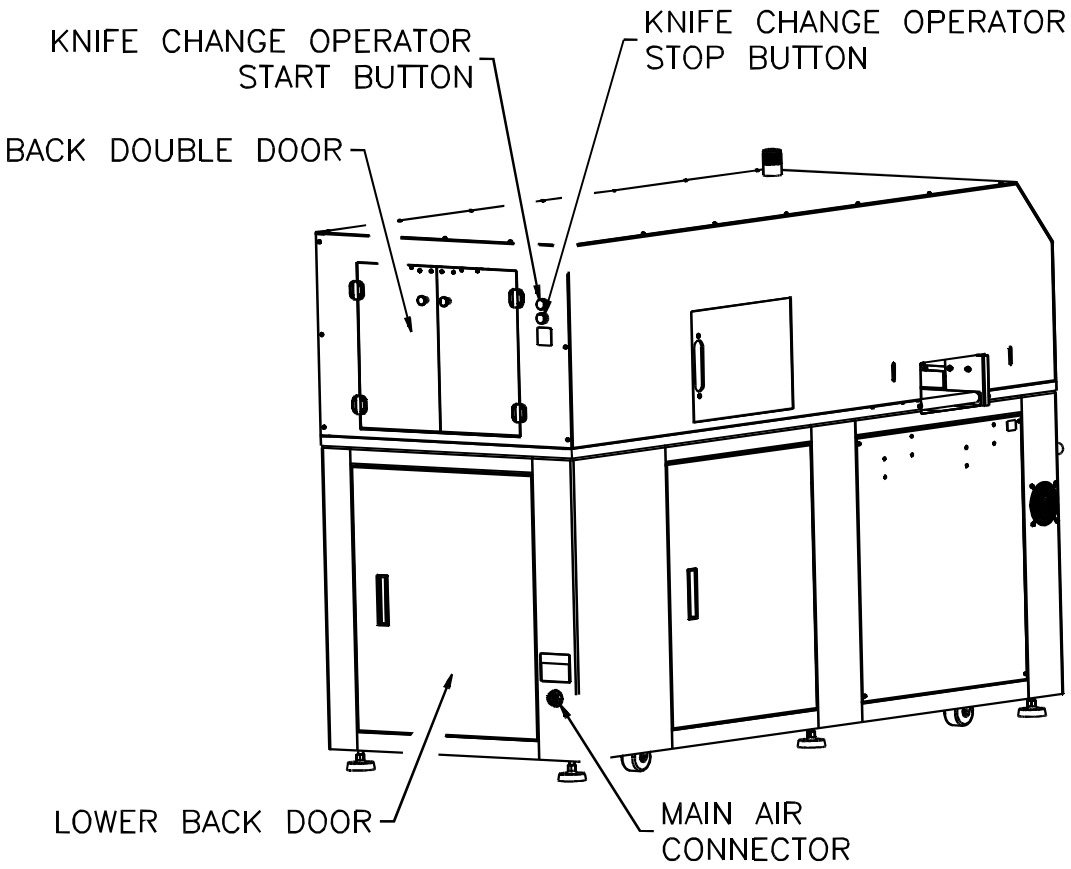


Figure 1-6. Back View

1.8.3 Exit Conveyor

Part Number: 56420

Important locations are shown in Figure 1-7.

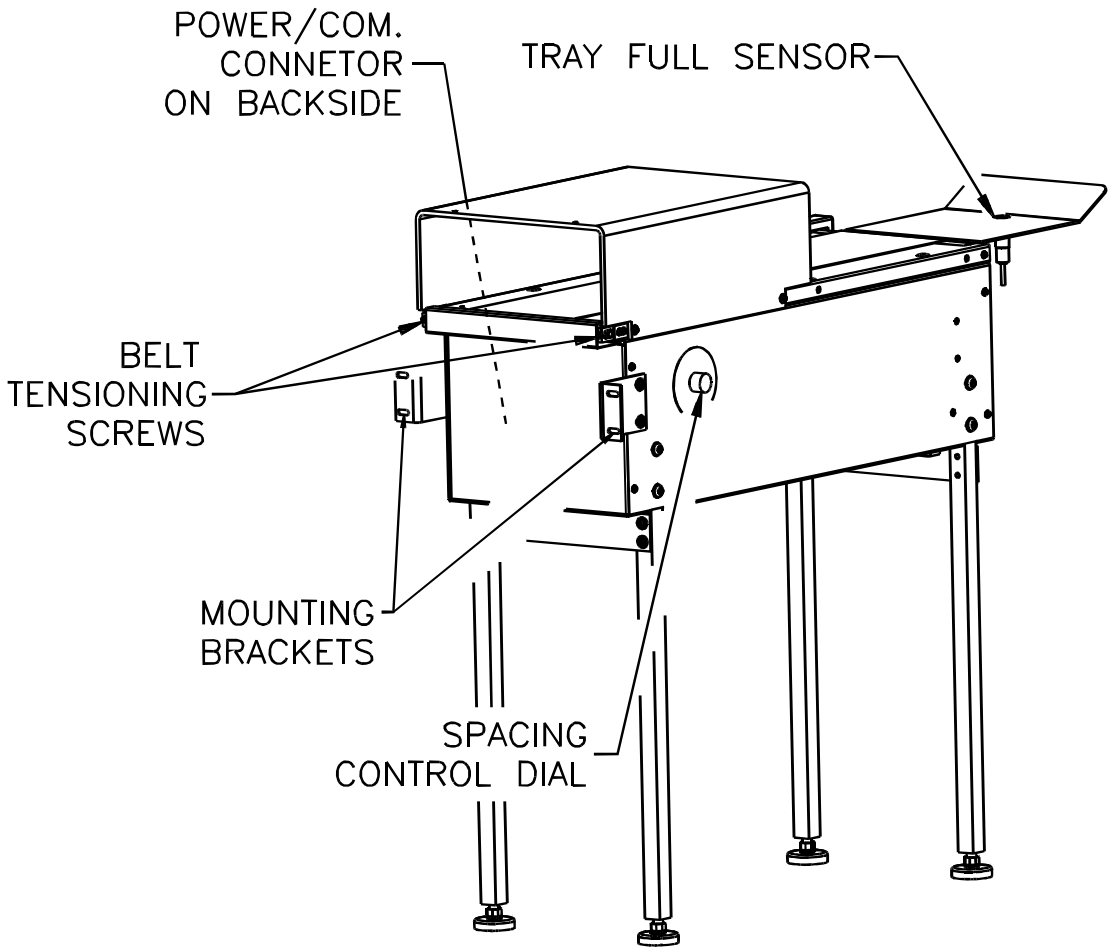


Figure 1-7. Exit Conveyor Locations

1.8.4 In-feed Conveyor

Part Number: 56401

Important locations are shown in Figure 1-8.

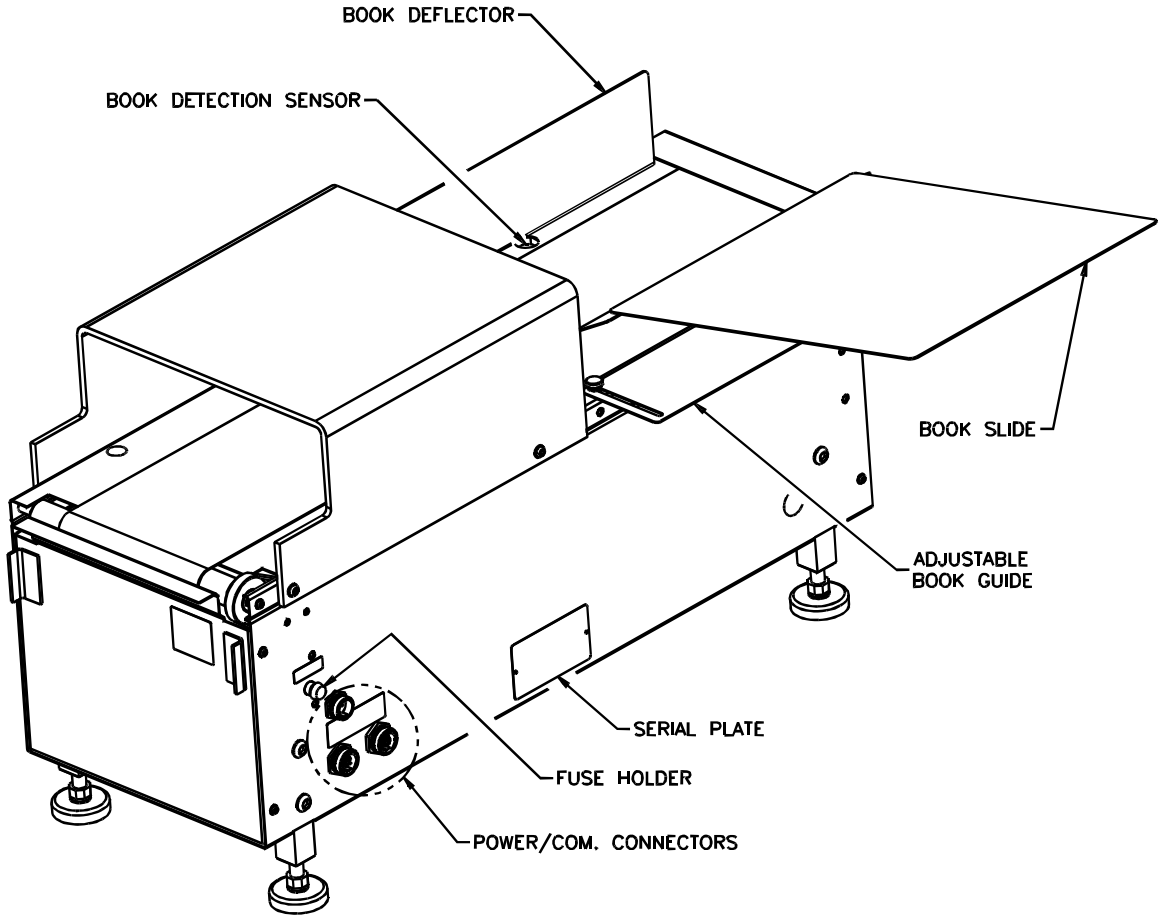


Figure 1-8. In-feed Conveyor Locations

1.8.5 Tilt In-feed Conveyor

Part No.: 56600

Important locations are shown in Figure 1-9.

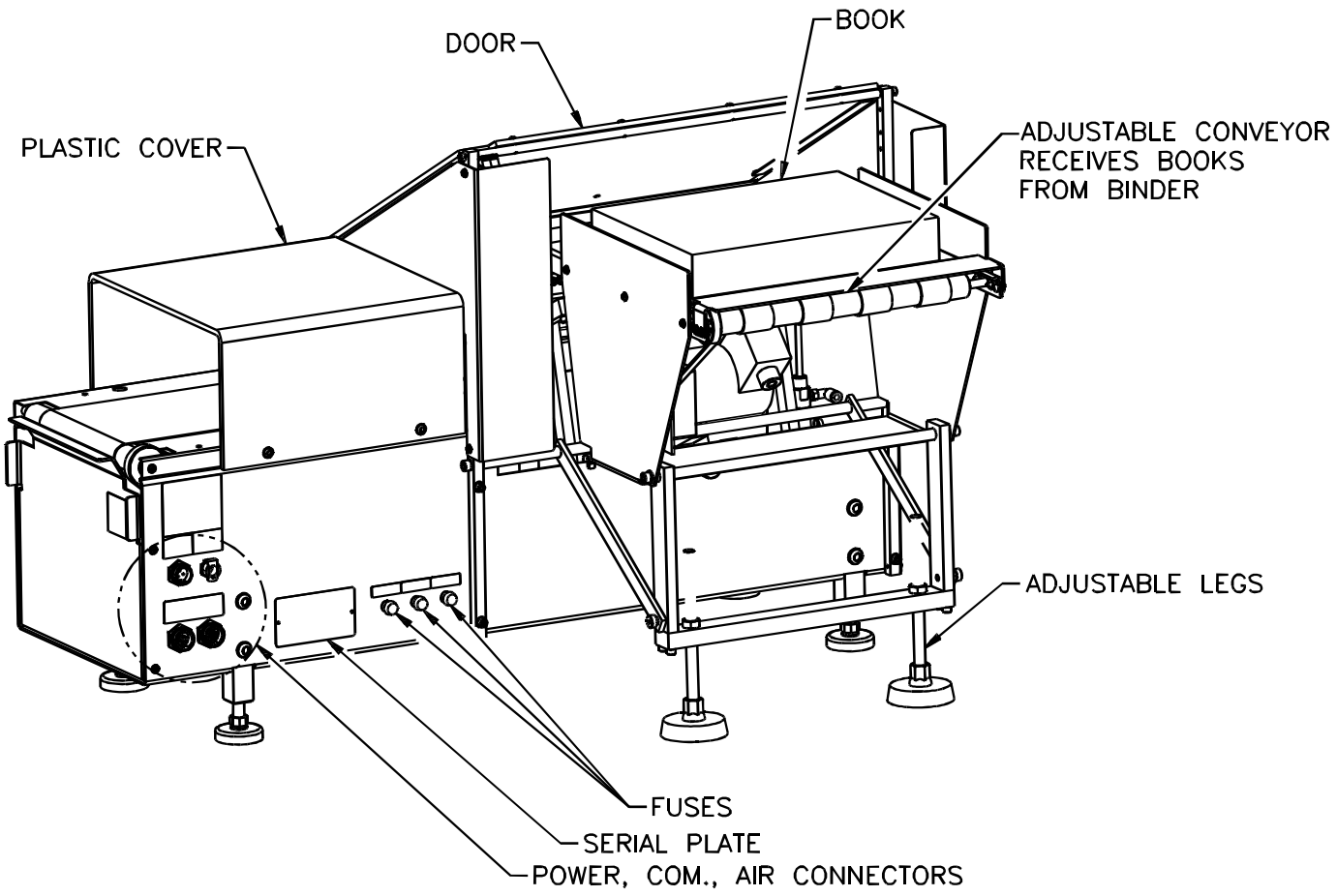


Figure 1-9. Tilt In-feed Conveyor

1.8.6 Elevator

Part Number: 56421

Important locations are shown in Figure 1-10.

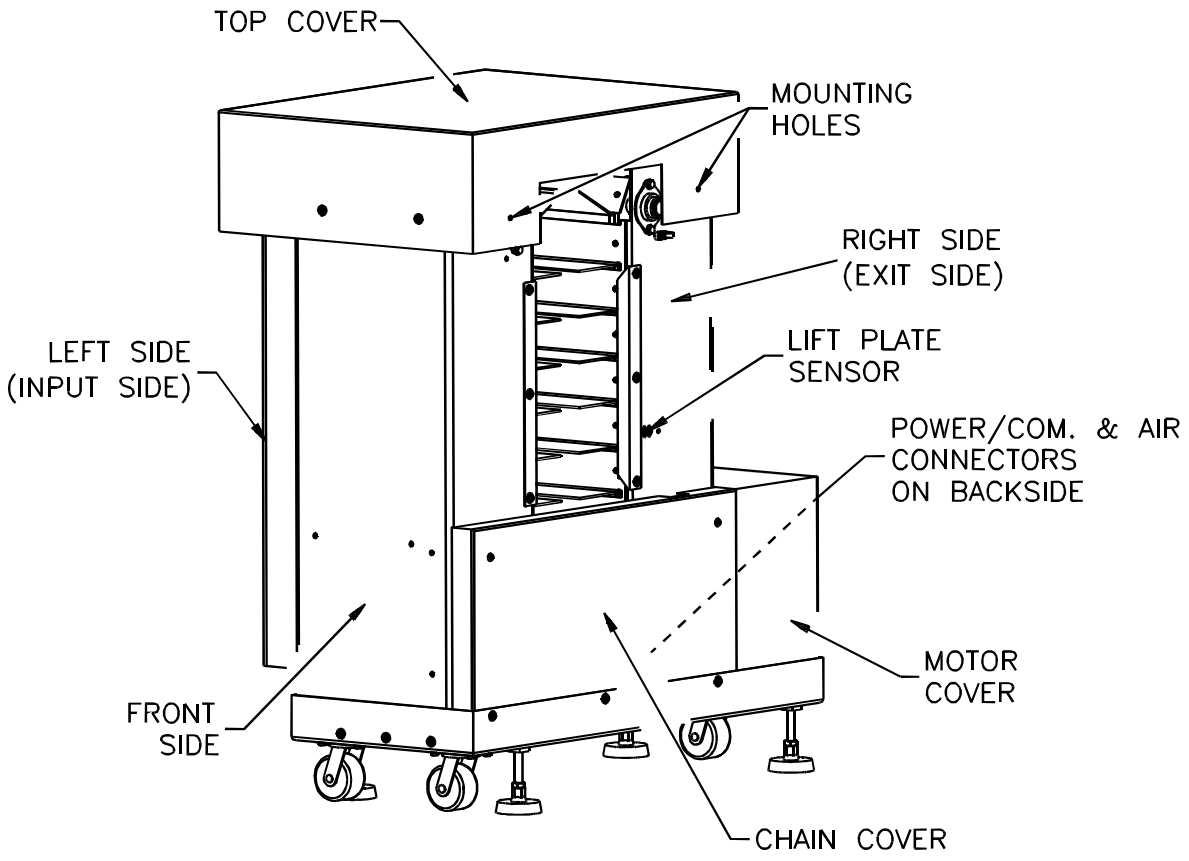


Figure 1-10. Elevator Locations

1.8.7 Hand-feed Conveyor

Part Number: 56416

Important locations are shown in Figure 1-11.

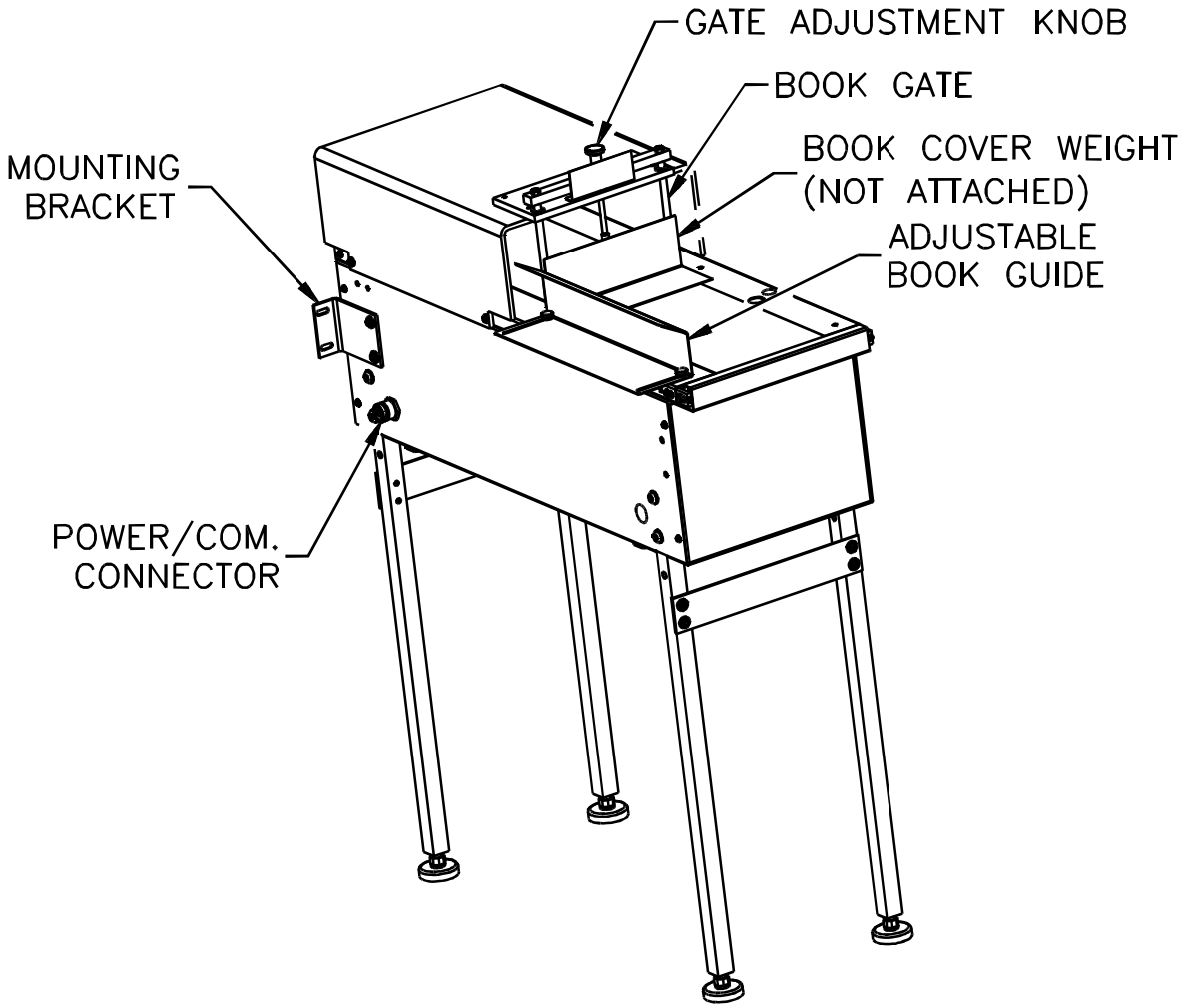


Figure 1-11. Hand-feed Conveyor Locations

1.9 Site Specifications

The installation site must have adequate space and utilities to support the trimmer with its setup options. It requires a supply of compressed air and electricity. Refer to section 1.7 Specifications on page 1-8 to verify that the site can accommodate these requirements. Use the following figures to determine floor space requirements for the option to be installed.

1.9.1 In-line Option 1

This in-line option is used when automated transport of books from a binder to the trimmer is required and book size changes are infrequent. It includes the CMT 330 basic machine, two conveyors, and an elevator. See Figure 1-12 for space requirements.

Note the locations of the air and power hook-up locations. Air and power lines should be dropped from the ceiling in order to have clear access to the waste bins using a rolling cart.

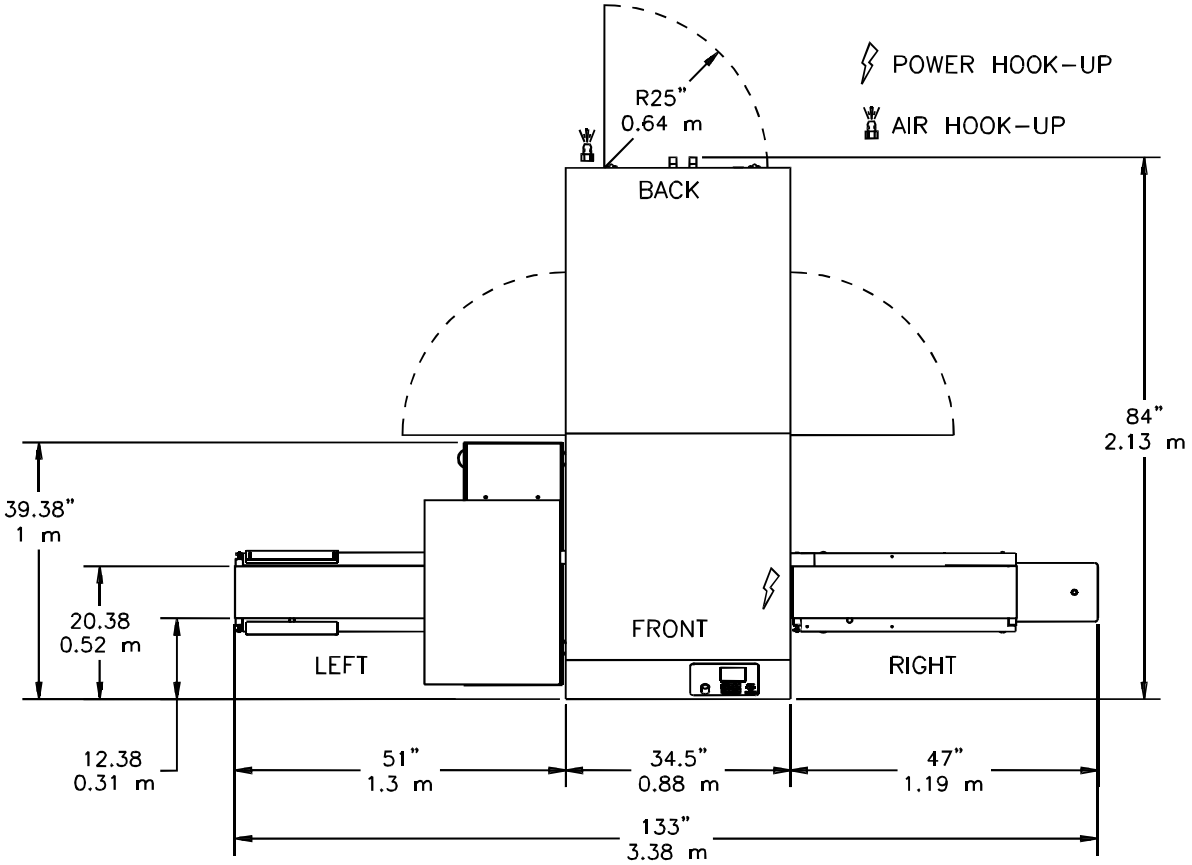


Figure 1-12. In-line Option 1

1.9.2 In-line Option 2

This in-line option is used when automated transport of books from a binder to the trimmer is required and book size changes are frequent. It includes the CMT 330 basic machine, two conveyors, and an elevator. See Figure 1-13 for space requirements.

Note the locations of the air and power hook-up locations. Air and power lines should be dropped from the ceiling in order to have clear access to the waste bins using a rolling cart.

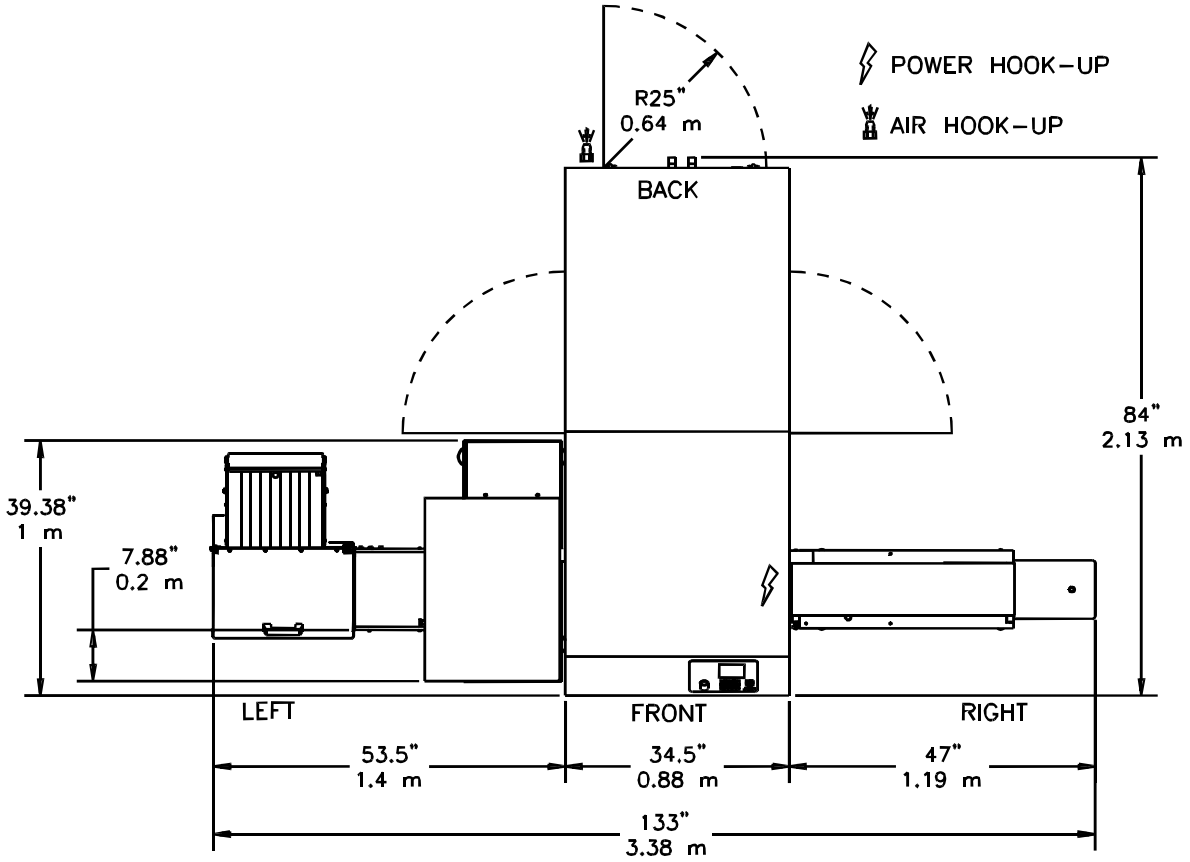


Figure 1-13. In-line Option 2

1.9.3 Stand-alone Option

The stand-alone option is used when books are fed to the trimmer by hand. It includes the CMT 330 basic machine and two conveyors. See Figure 1-14 for space requirements.

Note the locations of the air and power hook-up locations. Air and power lines should be dropped from the ceiling in order to have clear access to the waste bins with a rolling cart.

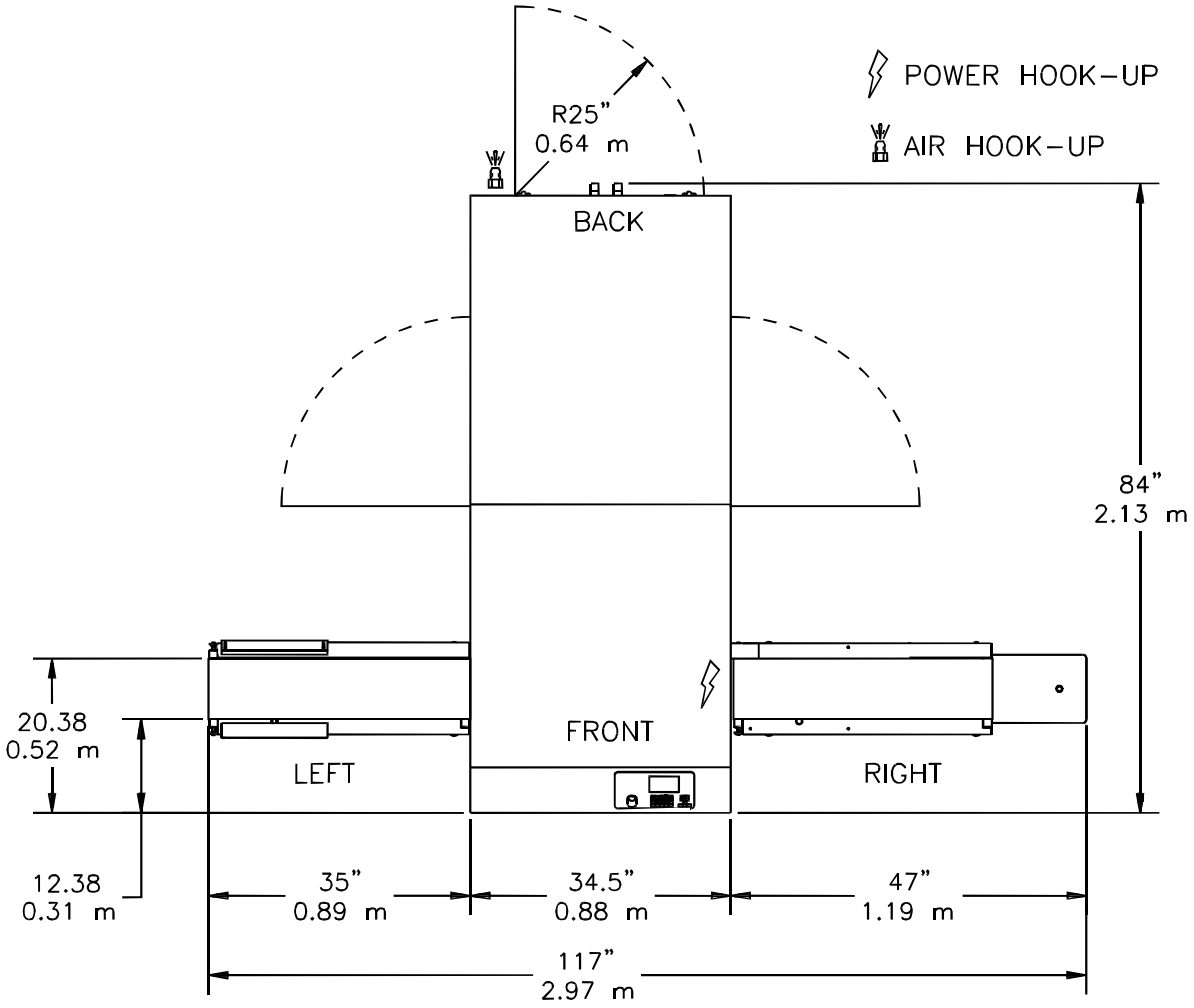


Figure 1-14. Stand Alone Option

NOTES:

2 Installation Guide

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Introduction

The installation guide provides information and instructions essential to the proper setup of each of the CMT 330 and its accessory options. These applications include one option for in-line operation and one option for stand-alone operation.

2.1 Shipping Claims

The CMT 330 has been packed to prevent damage during shipment. Claims for damage or loss are the responsibility of the recipient. Inspect all shipments as soon as they are received. If there is any noticeable damage, note it on the freight bill. Visual and/or hidden damage must be reported to the claims department of the carrier within 15 days. Contact your dealer if you need any assistance. Check the contents of the crate against both the packing list on page 1-5 and the freight bill. Make sure there are no missing items.

2.2 Unpacking

Remove the packing materials and four lag bolts. One lag bolt is located in the frame, behind each of the lower side doors as shown in Figure 2-1.

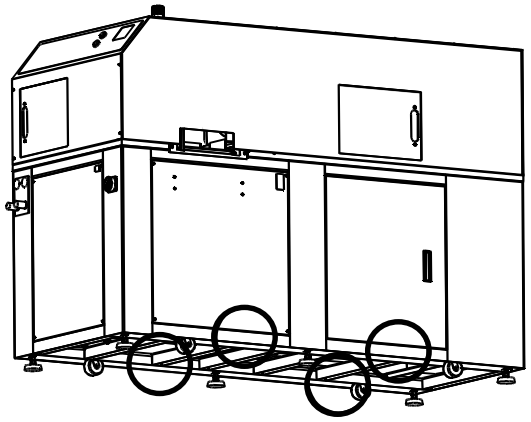

Figure 2-1. Lag Bolt Locations

Remove Lag Bolts

1. Remove four screws from each of the two front side doors using a 1/8" hex wrench.
2. Using a 9/16" open-ended wrench, remove the lag bolts from the two front locations shown in Figure 2-1.
3. Pull open the two lower rear doors and remove the waste bins.
4. Remove the two lag bolts from the two rear locations shown in Figure 2-1.
5. Reinstall the waste bins and close the rear doors.
6. Reinstall the two front side doors.

Use a forklift to remove the machine from the skid and place it as close as possible to its installation location. The machine has accessory power cables and air hoses wrapped-up and placed inside the machine. Be careful not to pinch or entangle these in the forks while lifting.

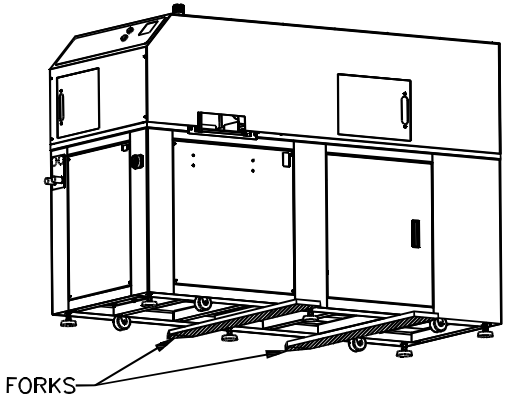

Figure 2-2. Fork Location for Lifting

2.3 Moving

Once the machine is near its final location, it can be rolled into place.

WARNING

Do not roll on a graded surface. Roll only on a flat surface. Personal injury could result.

It may be necessary to raise the six leveling pads in order to roll the machine. A pad is located under each corner of the machine. Each of the remaining two pads is located under the middle of each side of the machine. Using either a 3/4" open-ended wrench or an adjustable wrench, turn the leveling pad counterclockwise to raise it.

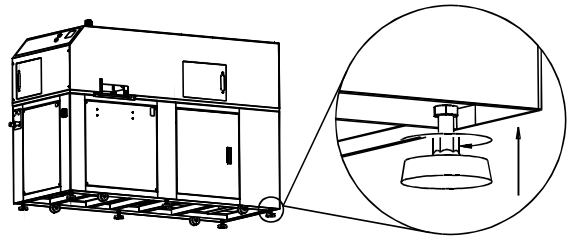

Figure 2-3. Leveling Pads

Push the CMT 330 into position. Do not lower the leveling pads at this time. Its final position may require slight adjustment depending upon the setup.

2.4 Option Setup

The CMT 330 can be used either in-line with a perfect binder or as a stand-alone three knife trimmer. The following table lists the accessories required for each application.

In-line option 1:	56401	Basic In-feed Conveyor
	56421	Cooling Elevator
	56420	Exit Conveyor
In-line option 2:	56600	Tilt In-feed Conveyor
	56421	Cooling Elevator
	56420	Exit Conveyor
Stand-alone option:		
	56413	Hand-feed Conveyor
	56420	Exit Conveyor

2.4.1 In-line Option 1

Dimensions given in this in-line setup are typical when used in conjunction with a CP Bourg perfect binder. Other binders may require different settings or additional custom equipment to deliver untrimmed books to the in-feed conveyor.

The following brief sequence of operations describes the movement of books through this in-line system. A book falls from the exit chute of the binder onto the in-feed conveyor. The in-feed conveyor deposits the book onto the lowest shelf of the elevator. The elevator accumulates books until it reaches capacity. Before an additional book enters the elevator, the elevator pushes the top book into the trimmer. The trimmer will hold one book inside while another is being trimmed. The trimmer cuts the book and sends it to the exit conveyor. The operator adjusts a dial on the exit conveyor to obtain the desired amount of spacing or overlap between books. If a book covers the sensor at the end of the exit conveyor, the machine stops. The attendance light on top of the machine blinks slowly. Books must be removed from the exit conveyor in order to continue operation.

Proper setup of each machine is essential because books move through four separate machines. The machines are first set roughly into place relative to the binder.

2.4.1.1 In-feed Conveyor

1. The ledge on the right end cover should be set to about 13.5" (343 mm) from the floor. Adjust the leveling pads as necessary.
2. Place the in-feed conveyor approximately flush with the front most face of the binder as shown in Figure 2-4. The covered end of the conveyor faces to the right. The right end of the plastic cover should be about 3-1/2" (89 mm) from the right end of the binder.
3. Place the book slide (56480) under the binder's book slide and set the bracket end of the conveyor's book slide against top edge of the deflector (56415) as shown in Figure 2-5.

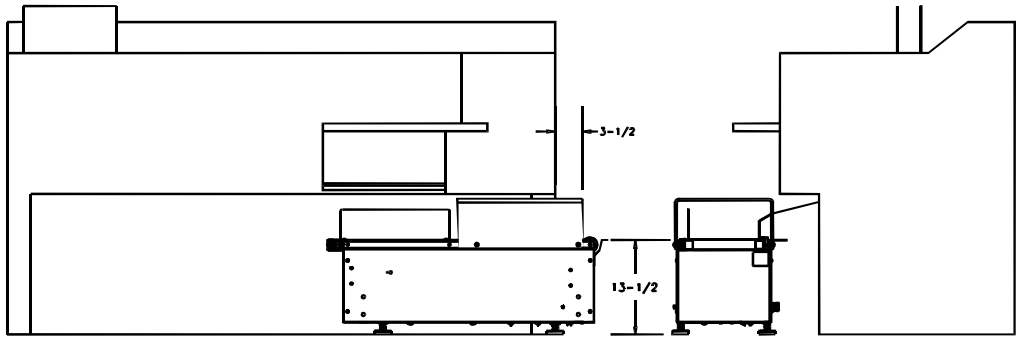

Figure 2-4. Placement of In-feed Conveyor

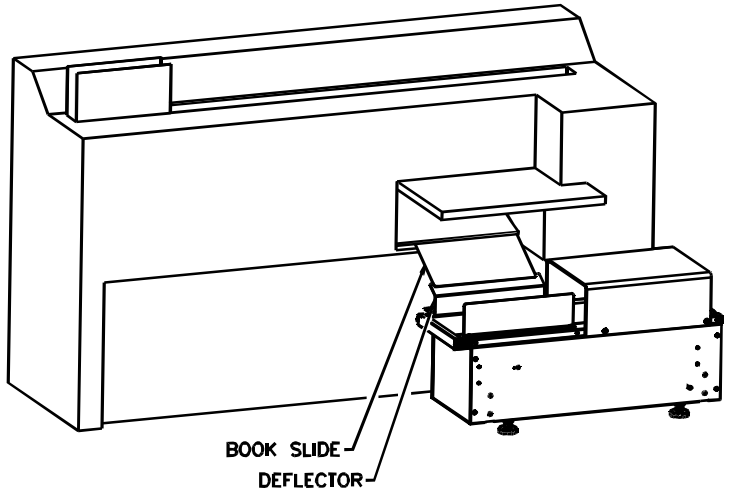

Figure 2-5. Book Slide Placement

2.4.1.2 Elevator

1. The top shelf should be 36" (914 mm) from the floor as shown in Figure 2-8. Adjust the leveling pads as necessary.
2. Align the elevator with the in-feed conveyor by sliding the opening of the clear plastic cover over the in-feed conveyor's plastic cover.

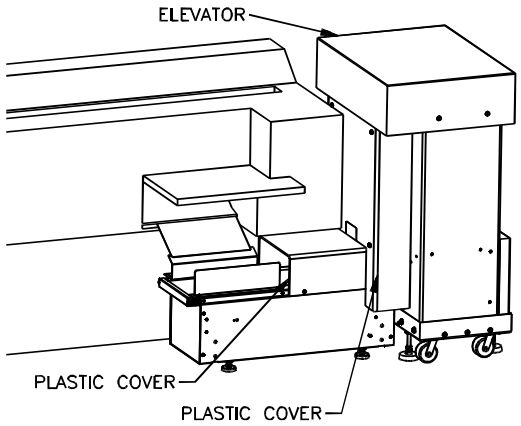

Figure 2-6. Elevator Placement

2.4.1.3 Trimmer

1. Install the scanner bracket onto the left front door of the trimmer. Make sure the top of the bracket is flush with the trimmer's in-feed conveyor belt.
2. Remove the lower front door of the trimmer and locate the loose photoelectric sensor. Remove the nuts from the sensor and push the sensor through the split cap bushing in the left side of the trimmer's base. Attach the sensor as shown in Figure 2-7. Bar code scanner and additional photo-sensor are no longer available.

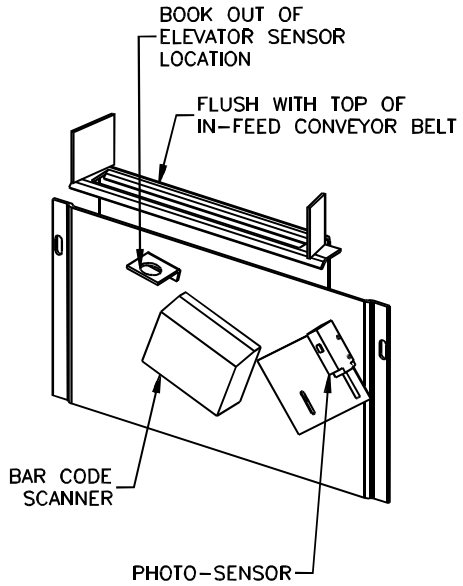

Figure 2-7. Scanner Bracket Installation

3. Remove the two sets of screws and washers from the holes in the right side of the top cover of the elevator (Figure 2-8). Save them for later use.
4. Move the trimmer next to the elevator such that the two holes in the right side of the top cover of the elevator (Figure 2-8) line up with the two slots on the left side of the trimmer's sheet metal enclosure.
5. Adjust the trimmer's leveling pads such that the top of the table is 36" (914mm) off the floor. Raise the two pads at the center of the machine.

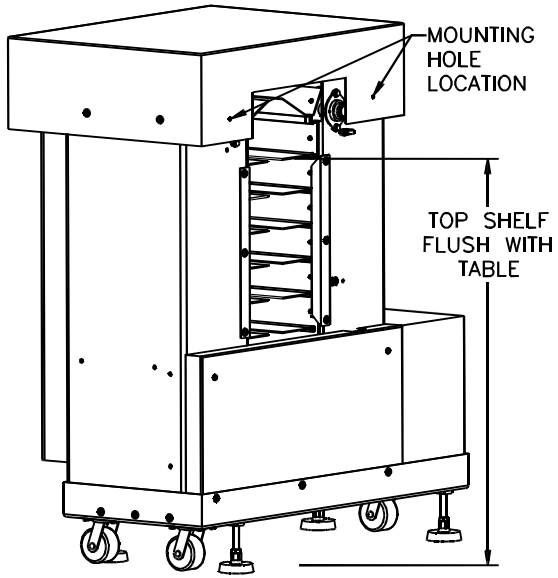

Figure 2-8. Elevator Mounting

6. Open the trimmer's front door and use a level on the table inside the machine. Level the front end of the machine by adjusting the leveling pads. Keep the final table height at 36".
7. Open the rear doors and repeat step 4 on the rear end of the machine.
8. Check the front end of the machine with the level to make sure the front is still level. Adjust as necessary.
9. After leveling the machine, lower the two pads at the center of the machine.
10. Lock all (6) leveling pads in place by tightening the jam nuts against the inside of the machine's base as in Figure 2-9. The nuts are accessed from inside the machine.

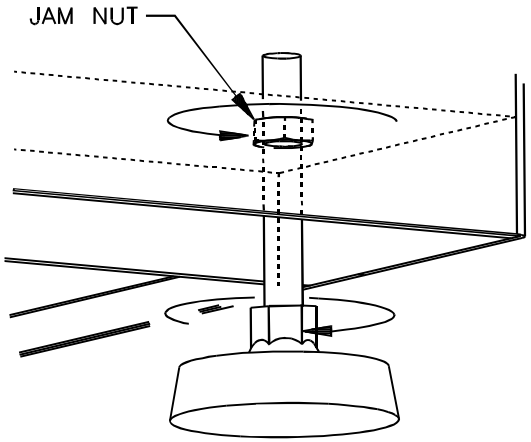

Figure 2-9. Tighten Jam Nuts

11. Align the two long slots in the trimmer's enclosure with the two mounting holes in the top cover of the elevator.
12. Using the hardware removed in step 1, reach through the trimmer's front door and fasten the trimmer to the elevator.
13. Connect shop air to the port at the rear of the trimmer. Refer to 2.6 Air Hookup on page 2-9.

At this point, the setup should look like Figure 2-10.

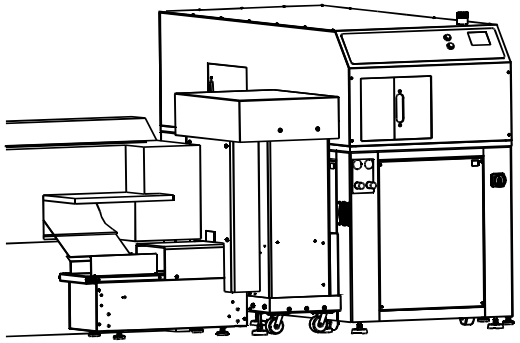

Figure 2-10. Current Progress

2.4.1.4 Exit Conveyor

Before proceeding, go to Section 2.5 Power Hookup on page 2-8. Main power must be connected to the machine before proceeding.

1. Remove (4) sets of screws and washers from the power panel door of the Trimmer. Save them for later use.
2. Make sure the exit conveyor's leveling pads are set to 33-7/8" as shown in Figure 2-11. Adjust as necessary.

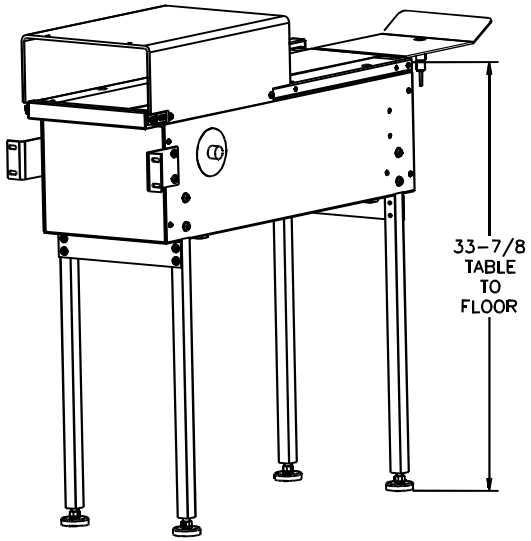

Figure 2-11. Exit Conveyor Leveling Pads

3. Move the exit conveyor to the right-hand side of the trimmer such that the slots in the conveyor mounting brackets line up with the holes in the power panel door as shown in Figure 2-12.
4. Fasten the conveyor to the trimmer using the hardware from step 1.

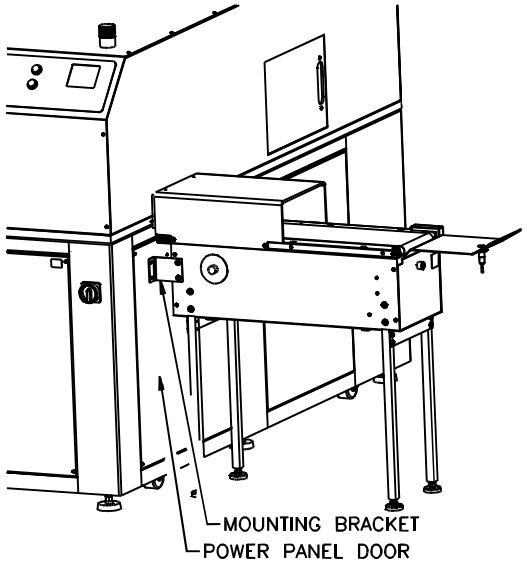

Figure 2-12. Exit Conveyor Placement

The completed setup should look like Figure 2-13. The accessory cables and hoses can now be connected to the trimmer.

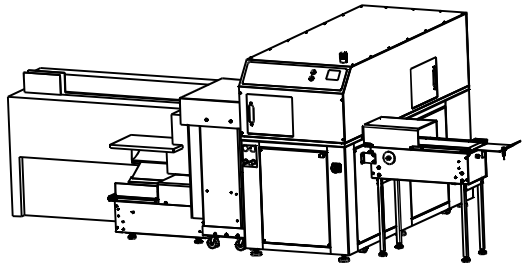

Figure 2-13. Completed Setup

2.4.1.5 Hookup Accessory Cables

Power cables must now be connected to each conveyor. Two air hoses and one power cable must also be connected to the elevator.

Access the cables and hoses stored inside the machine through the front door.

In-feed Conveyor

1. Unwrap the two cables labeled In-feed Conveyor.
2. Route the cable behind the hydraulic power unit and under the left-hand side of the machine base.
3. Connect the cables to the sockets on the backside of the in-feed conveyor. Lock into place by threading the connector collar onto the socket.
4. Connect the yellow cable from the Cooling Elevator to the in-feed conveyor.
5. If the Tilt In-feed Conveyor is being used, connect the air hose with the red cap to the port on the conveyor. Also,

Cooling Elevator

1. Unwrap the cable labeled Cooling Elevator.
2. Route the cable behind the hydraulic power unit and under the left-hand side of the machine base.
3. Connect the cable to the socket on the backside of the elevator. Lock into place by threading the connector collar onto the socket.
4. Unwrap the two coiled hoses with quick disconnect fittings that have yellow and black caps. Route them with the cable from step 3.
5. Push the hose connector with the black cap into the fitting on the elevator with black label above it.
6. Push the hose connector with the yellow cap into the fitting on the elevator with yellow label above it.

Exit Conveyor

1. Unwrap the cable labeled Exit Conveyor.
2. Route the cable under the power panel enclosure and out the right-hand side of the trimmer base.
3. Connect the cable to the socket on the backside of exit conveyor. Lock into place by threading the connector collar onto the socket.

2.4.2 In-line Option 2

The setup for option 2 is virtually identical to that of option 1. This section will highlight the differences. Refer to section 2.4.1 on page 1-17 for the remainder of instructions.

Use the following procedure in place of section 2.4.1.1 In-feed Conveyor.

2.4.2.1 Tilt In-feed Conveyor

1. The ledge on the right end cover should be set to about 13.5" (343 mm) from the floor. Adjust the leveling pads as necessary.

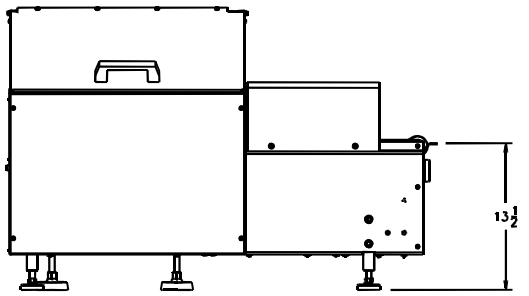

Figure 2-14. Height Adjustment

2. The Tilt In-feed Conveyor is set in front of the binder such that adjustable portion of the conveyor is centered on the exit chute of the binder.
3. The adjustable portion should be set to the height of the bottom of the binder's exit chute. After adjusting the legs, lock into place with jam nuts.

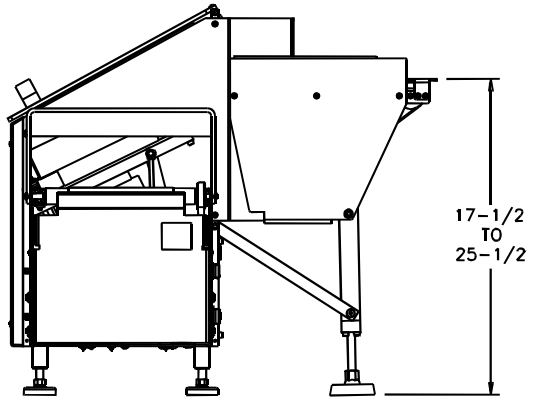

Figure 2-15. Adjustment Range

4. Move the entire conveyor close to the binder to minimize the distance between the adjustable conveyor and the binder's exit chute.

2.4.3 Stand-alone Option

This option uses the hand-feed conveyor and exit conveyor options to make the CMT 330 a stand-alone trimmer.

The gate opening in the hand-feed conveyor is set slightly larger than the thickness of books to be cut. Books are stacked onto the conveyor. The conveyor feeds them into the trimmer where they are cut. Finally, the books are delivered to exit conveyor where they are shingled out as necessary.

Follow these steps to setup the stand-alone option.

2.4.3.1 Trimmer

1. Make sure there is adequate floor space for this setup. Figure 2-16 illustrates how much space this setup will require.
2. Move the trimmer to the appropriate location.
3. Complete steps 5-10, and 13 in section2.4.1.3 on page 2-4.
4. Complete section 2.5 Power Hookup on page 2-8.

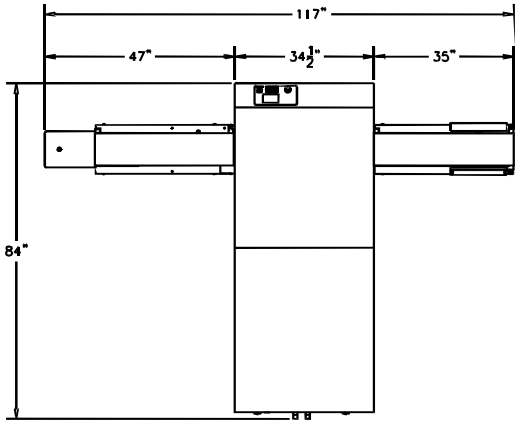

Figure 2-16. Stand Alone Space Claim

2.4.3.2 Exit Conveyor

Complete section 2.4.1.4 Exit Conveyor on page 2-5.

2.4.3.3 Hand Feed Conveyor

1. Remove (4) sets of screws and washers fastened to the center of the door on the left-hand side of the trimmer as shown in Figure 2-18. Save them for later use.
2. Make sure the hand-feed conveyor's leveling pads are set at 1-1/2" as shown in Figure 2-17.

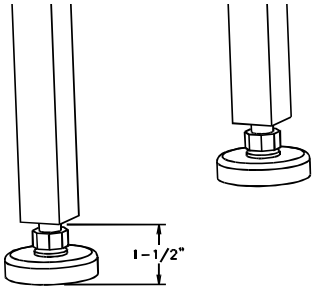

Figure 2-17. Hand-feed Leveling Pads

3. Move the hand-feed conveyor to the left-hand side of the trimmer such that the slots in the conveyor mounting brackets line up with the holes in the Trimmer's left-hand door as shown in Figure 2-18 and Figure 2-19.

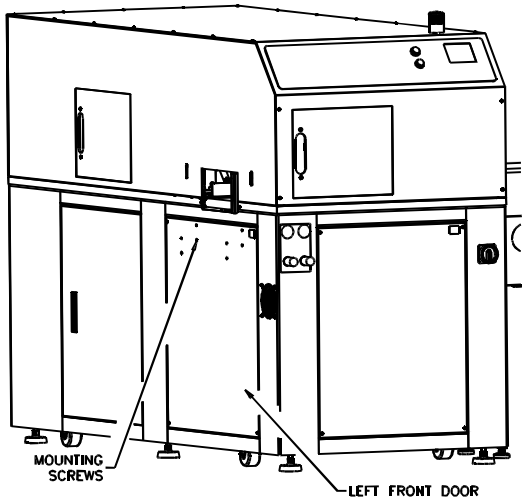

Figure 2-18. Hand Feed Mounting

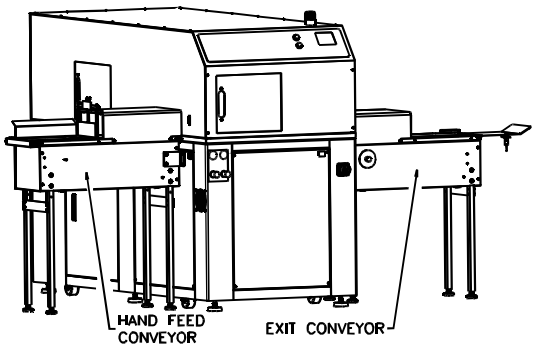

Figure 2-19. Stand Alone Application

4. Fasten the conveyor to the trimmer using the hardware from step 1.

2.4.3.4 Hookup Accessory Cables

Power cables must now be connected to each conveyor.

Remove the lower front door from the trimmer to access the cables and hoses stored inside the machine.

Hand Feed Conveyor

1. Unwrap the cable labeled In-feed Conveyor.
2. Route the cable behind the hydraulic power unit and under the left-hand side of the machine base.
3. Connect the cable to the socket on the backside of Hand-feed Conveyor. Lock into place by threading the connector collar onto the socket.

Exit Conveyor

To setup the exit conveyor, follow the instructions in section 2.4.3.4 Hookup Accessory Cables / Exit Conveyor on page 2-6.

2.5 Power Hookup

This section describes how to hookup main power to the CMT 330. An adequate power supply must be provided to the machine. See section 1.7 Specifications on page 1-8 for power requirements. It should be on its own circuit with a lockable, disconnect switch. Too many machines on the same circuit will reduce power to each machine. Insufficient voltage may cause overheating, loss of cutting/clamping force, and in extreme cases, failure to operate. Test the line voltage when the shop is at actual working levels.

The following table lists recommended wire sizes for different voltage options. If a wire is run over 75 feet (23 meters), the next size wire should be used.

Recommended Wire Sizes for Main Power Hookup			
V	Circuit Size A	Wire Size # AWG	Metric Wire mm^2
380/415	15	12	2.5
230	30	10	4
208	30	10	4

2.5.1 Power Hookup Procedure

The following procedure describes how to hookup main power to the CMT 330. After power is hooked up, running the machine will verify if wires are correctly connected to the terminal block on the power panel.

WARNING

Shock Hazard! Always disconnect power at main disconnect switch before working on the trimmer. Lock it out to prevent accidental power up. See Power Lockout Procedure on page 1-4.

1. Locate the power panel door at the front, right-hand side of the machine.

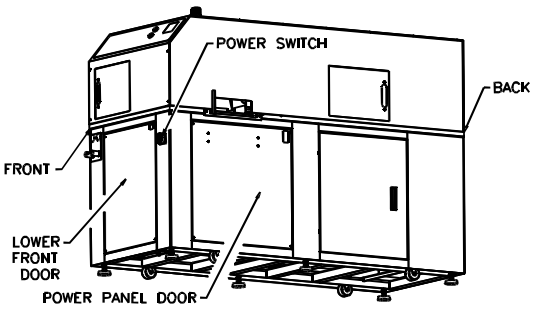

Figure 2-20. General Locations

2. Remove the four screws that mount the door to the machine and set the door aside. The terminal block is located at the lower, left-hand corner of the power panel. The ground screw is located beneath the terminal block as shown in Figure 2-21.
3. Remove the four screws that mount the lower front door to the machine and set the door aside.
4. Route the power cable under the right-hand side of the machine and behind the power panel enclosure.
5. Locate the cable hole in the back of the power panel enclosure. Mount a strain relief in this hole. Access this hole through the front door of the machine.
6. Route the cable through the strain relief and through the access hole in the power panel.
7. Fasten the ground lead to the ground terminal lug, labeled GND in Figure 2-21.

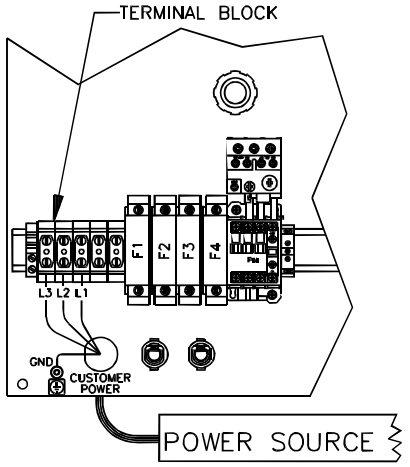

Figure 2-21. Power Panel

8. Fasten the three power leads to the three terminals **L1**, **L2**, and **L3** (Figure 2-21) on the main power terminal block.
9. Replace all panel doors. Make sure the shop air hose in connected to the machine and shop air is switched on. Open the lower, rear door and switch the main, air disconnect valve to the on (**I**) position and close the door.
10. Unlock and switch on (**I**) the main power disconnect.
11. Switch on (**I**) the machine's power.
12. Press the green start button key on the console, shown in Figure 2-22. The hydraulic motor should turn on. The machine was shipped with all three knives in the down position. If power is hooked up correctly, the knives will automatically raise to the up position. If power is incorrectly connected, the knives will remain in the down position. Continue at step 13 if the knives do not

move to the up position. If the knives move, skip to step 17.

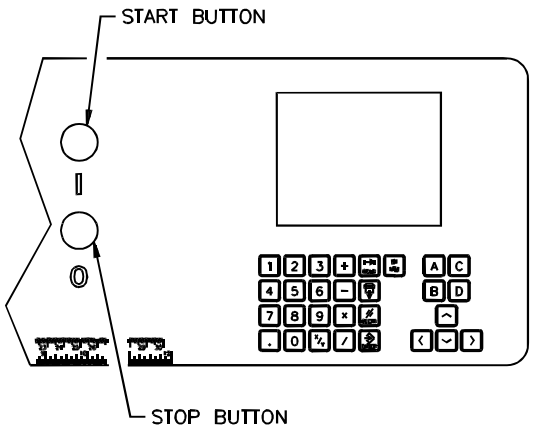

Figure 2-22. CMT 330 Console

13. Switch off (**O**) the machine's main power switch.
14. Switch off (**O**) the main power disconnect switch and lock it out.
15. Remove the power panel door at the right-hand side of the machine.
16. Exchange any two of the main power leads at the terminals **L1**, **L2**, or **L3**.
17. Repeat steps 9-12.

2.6 Air Hookup

The CMT 330 requires un-lubricated, compressed air at a minimum of **5** cubic feet per minute at 80-90 PSI. The main air connector shown in Figure 2-23 is a female 3/8 NPT port. A facilities maintenance technician should connect shop air using a male 3/8 NPT fitting using either Teflon thread tape or a liquid, pipe sealing compound.

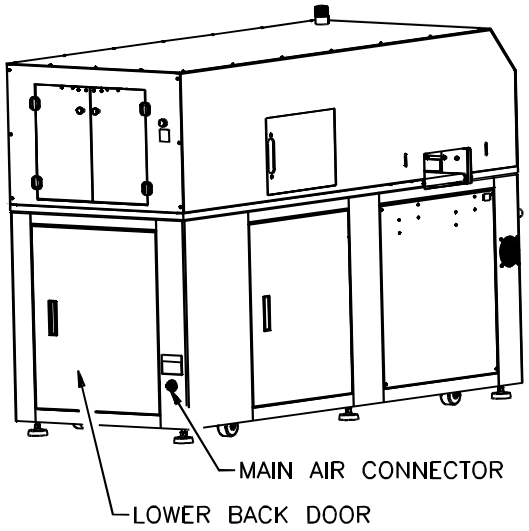

Figure 2-23. Main Air Connector

Using a flexible hose to connect the machine to shop air is preferred in case the location of the machine needs adjustment later. A line dropped from the ceiling is also preferred. Having the line off the floor enables the operator to wheel a cart to the lower left rear door for waste bin removal

2.7 Cleaning

It may be necessary to clean the machines after installation. They may be cleaned with a solution of dish soap and water. Do not use petroleum or acid based solvents to clean the machine. Damage may result.

NOTES:

3 Operator's Guide

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Introduction

The operator's guide provides instructions essential to operating the CMT 330 with each accessory option. These instructions include programming instructions and book size changeover, tasks.

3.1 Programming

The programming section gives detailed descriptions of how to efficiently program and store jobs within the CMT 330 computer.

3.1.1 Console Descriptions

The console is found on the front, right-hand side of the machine. General areas of the console are shown in Figure 3-1. The specific function of each key on the console is given in this section.

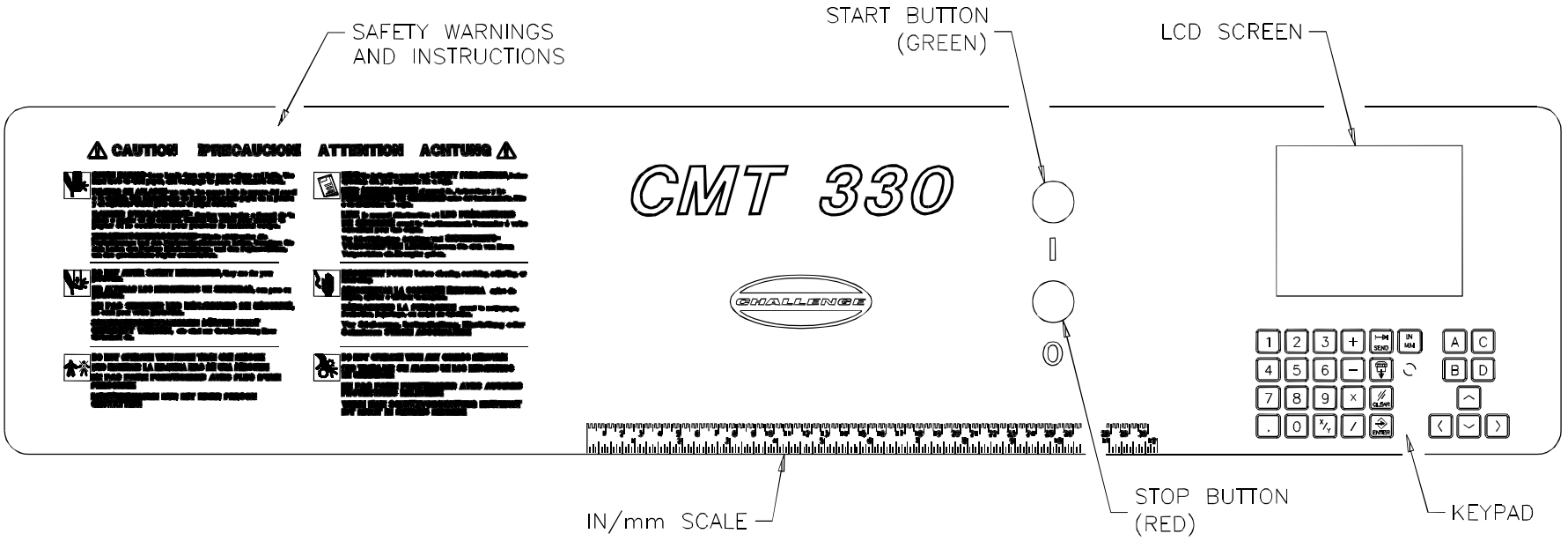


Figure 3-1. CMT 330 Console

Safety Warnings

Multi-language safety instructions with symbols are listed in this area of the console. Each operator should read and understand the instructions listed. If the operator does not understand these instructions, he should ask his supervisor for clarification.

IN/mm Scale

The IN/mm scale can be used for measuring the size of the start book while programming a job. The scale can also be used to verify the size of a trimmed book.

Start Button

The green start button is used to switch on the hydraulic pump and begin to trim books. A remote start button is located at the back of the machine.

Stop Button

The red stop button is used to switch off the hydraulic pump and stop trimming books. A remote stop button is located at the back of the machine.

LCD Screen

The LCD screen is used to program and view jobs. It also lists any errors or messages. A message is displayed on the screen when the status light on top of the machine blinks.

Keypad

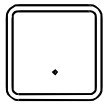
The keypad is used to enter values into a program, scroll through programs, and navigate through maintenance screens.

3.1.2 Key Descriptions

Number Keys

Number keys are used to write number values on the display.

Decimal Point

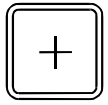


This decimal key is used to write a decimal point on the display.

Priority Add Key

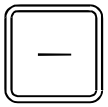
The priority add key is used to input fractional numbers when combined with a whole number. An underscore (_) is displayed on the screen after the key is pressed. 1_1/2 is an example of a number entered using the priority add key. This is equivalent to 1.500.

Addition Key



The plus key is used to add numbers in the display.

Subtraction Key



The minus is used to subtract numbers in the display.

Multiplication Key

The multiply key is used to multiply numbers in the display.

Division Key

The forward slash key is used to divide numbers in the display.

Send Key

The send key is used to instruct the computer to change the machine setup to match newly entered book dimensions.

Clear Key

The clear key is used to clear an entry value or clear an status message.

Enter Key

The enter key selects items in menu screens and processes data that has been entered in the other modes.

IN/mm Key

The units key is used to toggle between decimal inch, fractional inches, and mm units of length.

Soft Keys

The soft keys, or letter keys, are used to select screen menu options listed at the bottom of the display screen. The keys include the letters A, B, C, and D.

Up Arrow Key

The up arrow key is used to move the screen cursor up. It is also used to scroll forwards through the alphabet while naming a job.

Down Arrow Key

The down arrow key is used to move the screen cursor down. It is also used to scroll backwards through the alphabet while naming a job.

Right Arrow Key

The right arrow key is used to move the screen cursor right. It is also used to move the cursor to the right while naming a job.

Left Arrow Key

The left arrow key is used to move the screen cursor left. It is also used to move the cursor to the left while naming a job.

3.1.3 Using the Keypad

The following information briefly describes efficient ways to use the functions of the keypad.

Entering Fractions

Fractions are entered using the priority add key. The underscore symbol, _, is displayed when the key is pressed. This instructs the computer to add the fractional portion of the entry before performing the remaining math. This eliminates the need for parentheses.

Example: 3X2_3/4=8.250. If you use a plus instead of the priority add, the result would be 3X2+3/4=6.750.

Entering Math

Rather than using a separate calculator, the CMT 330's computer can calculate lengths as you enter values. However, you should be familiar with the order of numerical operations if you intend to use this feature. Multiplication and division operations are always performed before addition and subtraction.

Example: You wish to enter a dimension, which is 8 inches, minus (2 times 1 and 5/32 inches), plus 1/2 inch. This sentence can be entered as: 8-2X1_5/32+1/2. The result is 6.188.

3.2 User Interface Map

The following chart illustrates the organization of user interface screens encountered in the CMT 330 software.

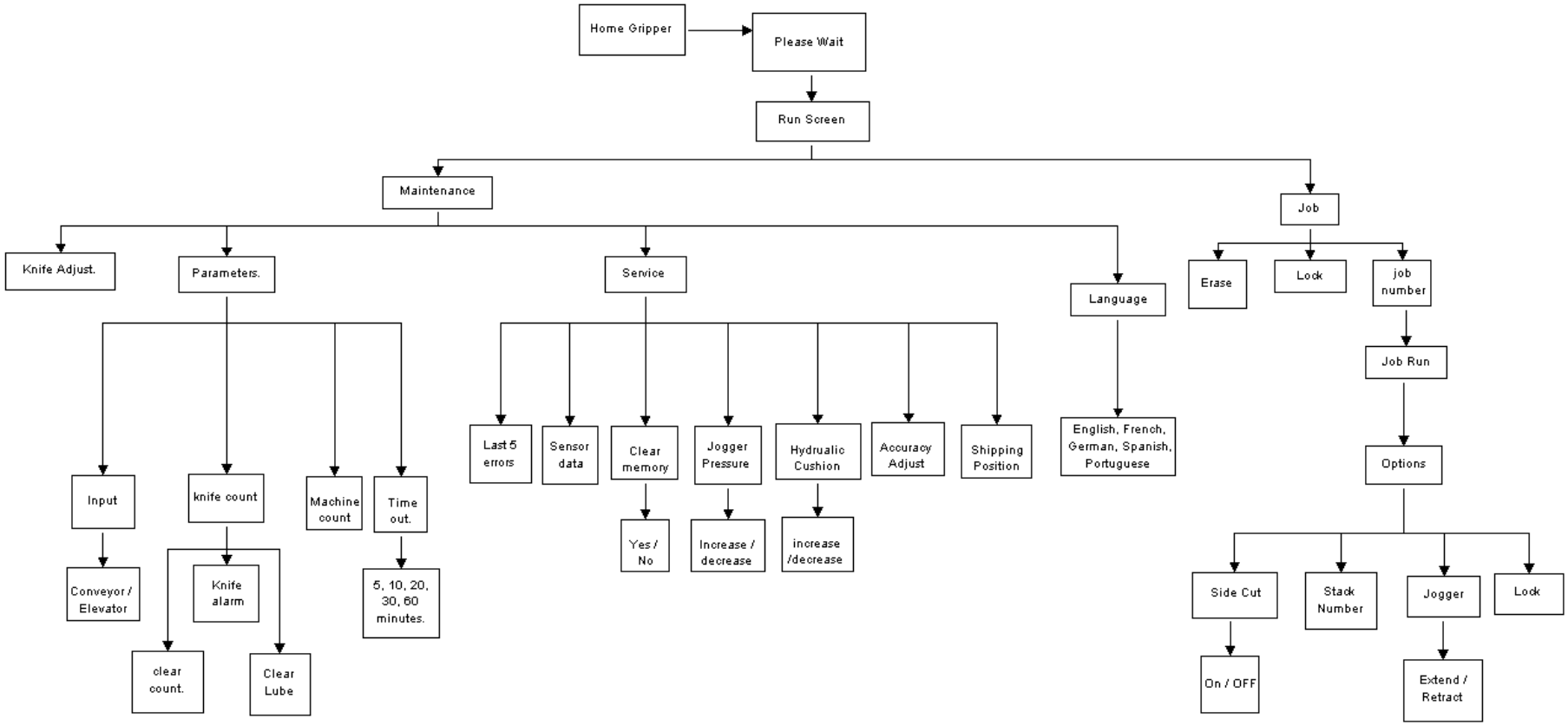


Figure 3-2. CMT 330 User Interface Map

3.3 Power up

When the CMT 330 is switched on, the power up screen will appear.

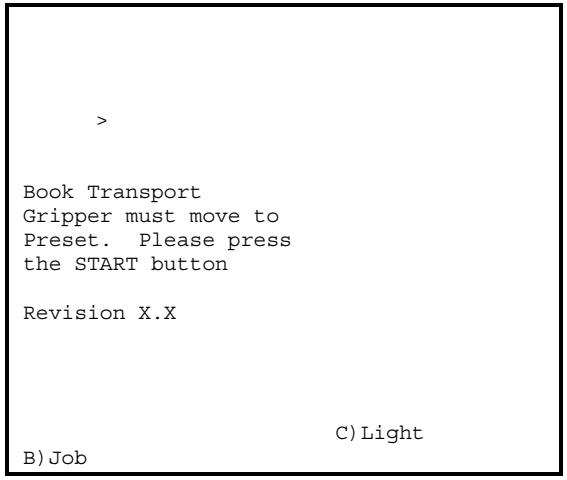


Figure 3-3. Start up Screen

Press and hold the green start button until the hydraulic motor starts. The following message will be displayed.

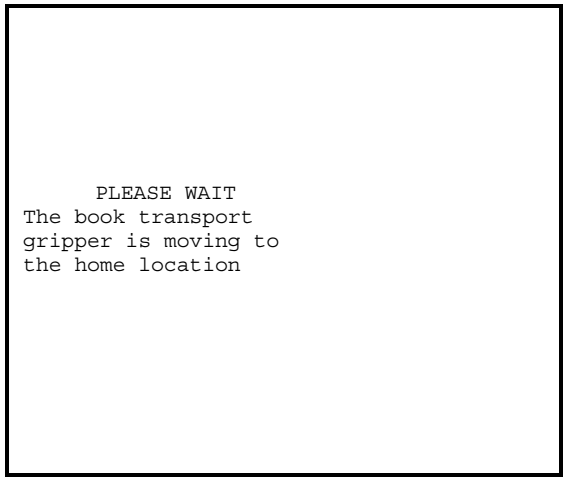


Figure 3-4. Start Prompt

The gripper will not move for approximately 3 seconds. The gripper will then move to approximately 1 inch in front of home position, back past home, then to home.

3.4 Improper Wiring

If the knives do not move to the up position after power up, then the three phase power is hooked up incorrectly. The following message is displayed.

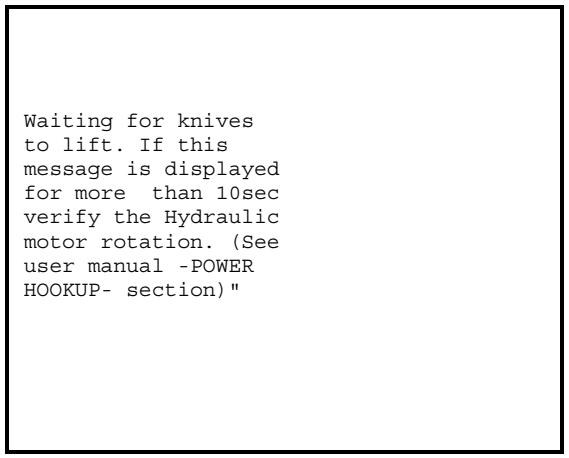


Figure 3-5. Power Hook Up Warning

See section 2.5.1 Power Hookup Procedure or page 2-8 to correct the wiring.

3.5 Run Mode

After the gripper reaches the home location, the Run screen will appear if there are no jobs stored in memory. Otherwise, the machine will initialize at the last job that was run. The conveyors will then start. The CMT 330 will sense incoming books and trim until the last book of that size is done.

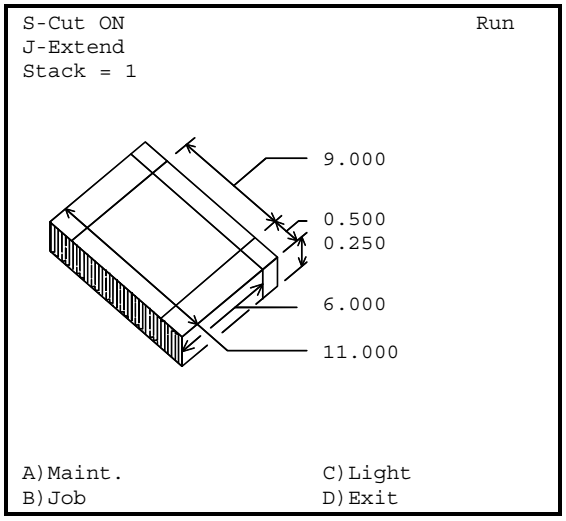


Figure 3-6. Run Screen

3.6 Job Mode

The CMT 330 can be programmed for up to 99 different jobs. A job is a particular book size including trim dimensions and options. Enter the Job screen by pressing the soft-key B. In the Job screen, all previously programmed job numbers will be displayed with their name and lock status. Locked jobs are indicated by a padlock symbol after their name. A plus sign at the bottom of the job list indicates there are more programmed jobs that are not displayed. Pressing the down arrow key will step through all jobs one at a time. Pressing the left arrow key and the down arrow key simultaneously will move the cursor down the list nine at a time.

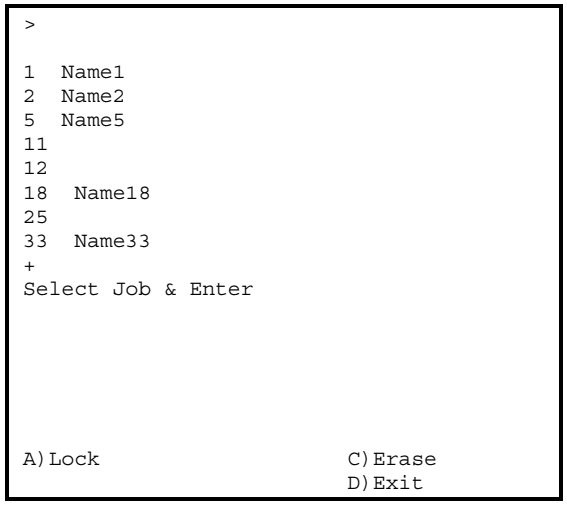


Figure 3-7. Job Screen

3.6.1 Creating a Job

To create a job, enter an unused job number between 1 and 99 inclusive. The job number is created with a blank name.

3.6.2 Editing a Job Name

The job name is edited in the job mode screen. To edit the name, use the up/down arrow keys to move the cursor to the appropriate job number. Then press the right arrow key to move the cursor to the desired character position and edit the character by pressing the up or down arrow keys to toggle between characters of the alphabet. Numbers can be entered directly by using the number keys. Pressing the clear key clears the current character. When finished, you may edit the current job by pressing the enter key, go to a different job, or exit job mode.

3.6.3 Lock/Unlock a Job

Locking a job prevents it from being edited. In the Job screen, the soft-key “A” will display `Lock` or `Unlock` depending on the status of the job. If a job is locked, the padlock symbol will be displayed at the right of the job name. To change the lock status of a job, move the cursor to the appropriate job using the up/down arrow keys, and press the soft-key “A” (Lock/Unlock).

The locking function may also be accessed through the Job Options menu (section 3.6.7) in the Job Run screen as shown in Figure 3-8.

3.6.4 Erasing a Job

Erasing a job will permanently remove it from memory. Use the arrow keys to select a job to be erased. Press the soft-key ”C” (Erase). `Clear channel #` is displayed, followed by `Yes` and `No`. Use the up/down arrow key to select either yes or no, then press enter. Note that locked jobs cannot be erased.

3.6.5 Editing a New Job

To edit a new job, type in a number that is not already assigned to a job and press enter (entering a job number greater that 99 will create #99). The cursor will move to the line corresponding to the number you entered, prompting your for a job name. If a job name is not desired, pressing enter again bring up the job edit screen.

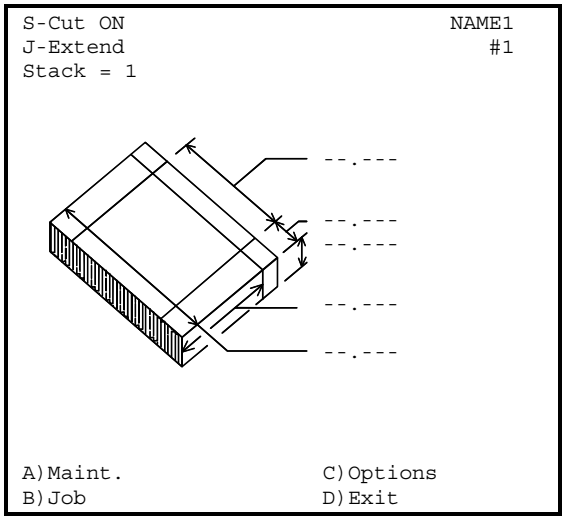


Figure 3-8. Job Run Screen

Use the arrow keys to move the cursor to the dimension to be edited. Type the dimension value, then press enter.

All dimensions must be supplied, or the job will not run. If the book size is outside the machine specifications, the message, `BOOK SIZE CANNOT BE TRIMMED`, is displayed. Refer to section 1.7.1 for sizes that can be cut.

3.6.6 Editing an Existing Job

If the job is not locked, it may be edited from either the Run screen or the Job Run screen. Using the arrow keys, move the cursor to the dimension to be changed. Enter a new value.

If the job is locked, it must be unlocked before editing. See section Lock/Unlock a Job.

3.6.7 Job Options

Each job has three options that are listed in the upper left corner of the display. These are Side Cut (ON/OFF), Jogger (Extend/Retract), and Stack number (1-3). To edit these options press the C key from the Job Run screen shown in Figure 3-8.

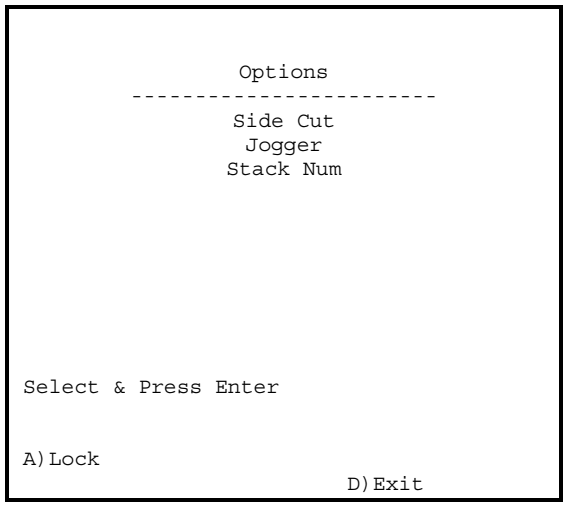


Figure 3-9. Job Options Screen

Use the up/down arrow keys to select the option and press enter to set the option.

3.6.7.1 Side Cut

When Side Cut is set to On, both the sides (top and bottom) and the face of the book are cut. When the Side Cut option is set to Off, only the face is cut. The side cut menu screen is shown below.

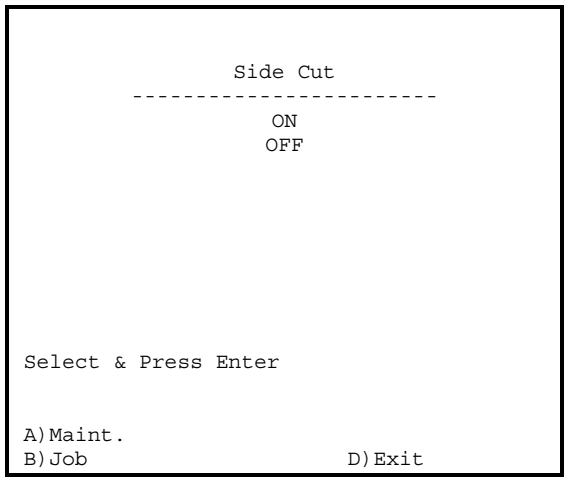


Figure 3-10. Side Cut Option Screen

3.6.7.2 Jogger

This parameter sets the jogger to remain extended as a book leaves the jogging station or retract immediately. In the jogger screen, use the up/down arrow keys to toggle the required jogger action and press enter.

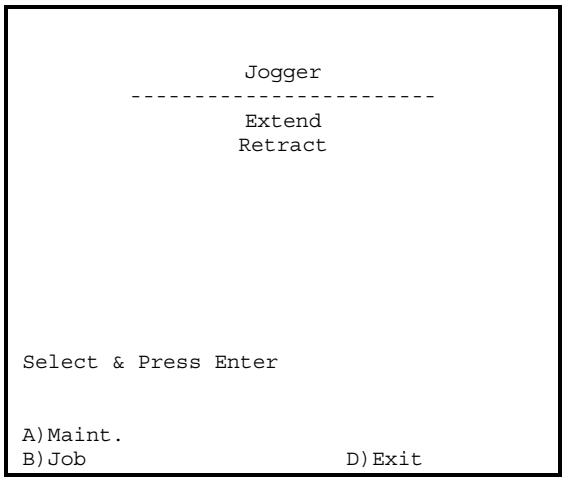


Figure 3-11. Jogger Option Screen

When cutting very thin books with overhanging covers, the jogger option should be set to Extend. Otherwise, it should be set to Retract.

3.6.7.3 Stack Number

This parameter sets the number of books to be stacked on top of each other at the exit conveyor before it is incremented. It can range between 1 and 200.

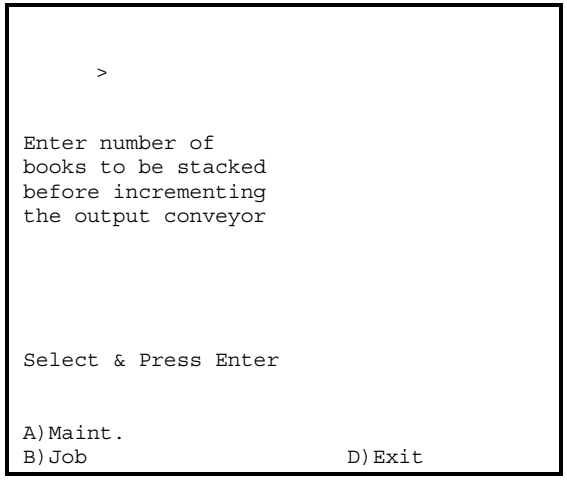


Figure 3-12. Stack Number Option Screen

This option is used to increase the capacity of the exit conveyor when cutting thin books. Be careful not to set the Stack Number too high. If the books stack too high before incrementing the exit conveyor, later books will jam inside the machine.

3.6.8 Running a Job

The job must first be opened from the Job screen by using one of two methods:

1. Move the cursor to the desired job with the arrow keys and press enter.
2. Enter the job number with the keypad and press enter.

Once a job has been opened, the current job name and number will be displayed in the upper right corner. Press the green start button on the console to start the hydraulics and conveyors. Press the send key to set the side knives and the registration assembly to the proper position. Once the motors start, books can be fed into the machine.

3.6.9 Closing a Job

To close an open job, press the soft-key B (Job) to return to Job mode, or press the soft-key D (Exit) to exit to the Run screen.

3.7 Maintenance Mode

Maintenance mode is a screen where many machine functions can be set or modified. The four principle functions are: Knife Adjust, Parameters, Diagnostics, and Language. To select a particular function, use the up/down arrow keys to toggle to the desired function and press the enter key. The following sections explain each function.

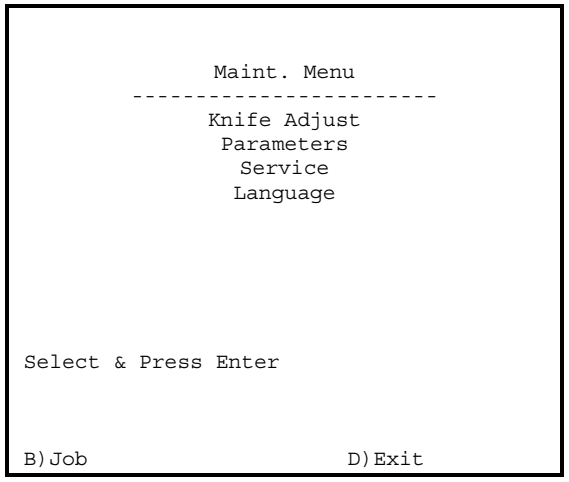


Figure 3-13. Maintenance Screen

3.7.1 Knife Adjust

Knife Adjust mode provides a way to easily set the knife, cutting depth after changing knives. Selecting Knife Adjust from the maintenance menu bring up the screen shown in Figure 3-14.

While the hydraulic pump is running and the conveyors are stopped, the knife depth is set by placing a sheet of paper under each knife, and pressing the button at the rear of the machine. This will cause the knives to cycle. Repeat pressing the button and adjusting the depth until the paper is cut clean through. See section 4.3.2 Knife Adjustment on page 4-7.

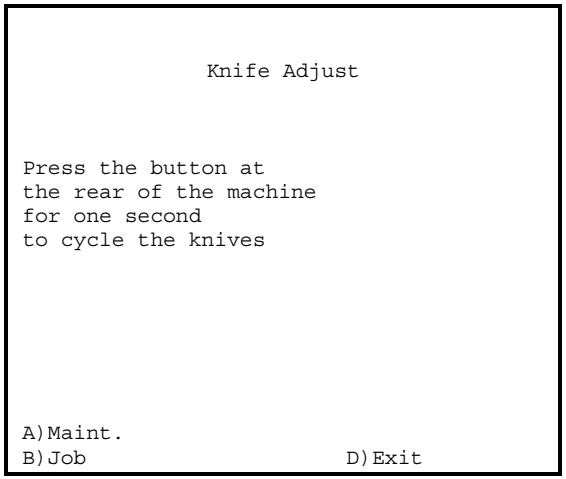


Figure 3-14. Knife Adjust Screen

3.7.2 Parameters

In the parameters screen shown in Figure 3-15 on page 3-10, use the up/down arrow keys to select a parameter, and press the enter key. The following sections describe the function of each parameter.

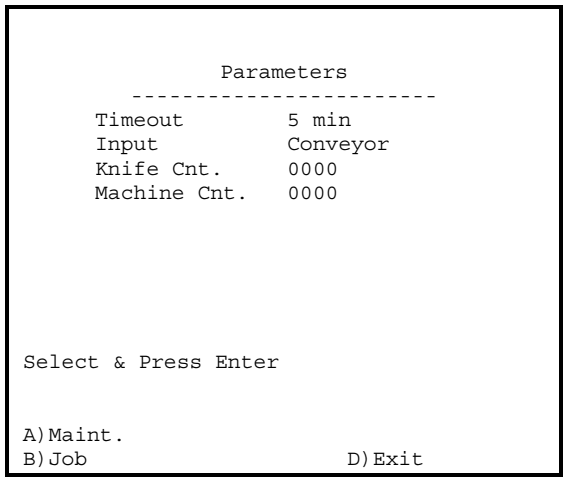


Figure 3-15. Parameters Screen

3.7.2.1 Timeout

This parameter sets the amount of idle time before the screen saver activates and the hydraulic motor turns off. The choices are 5, 10, 20, 30 and 60 minutes. In the time-out screen, use the up/down arrow keys to select the timeout period and press the enter key.

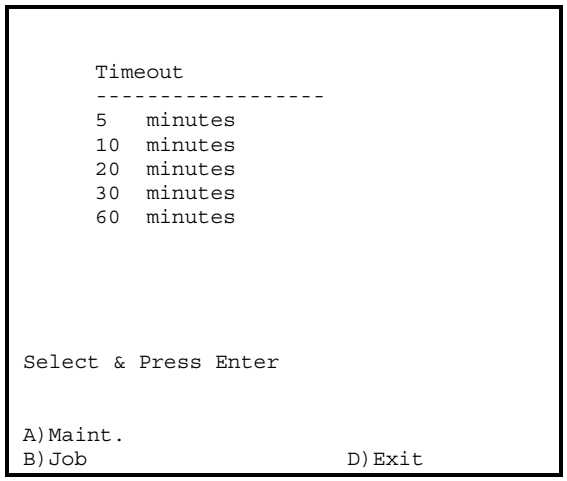


Figure 3-16. Timeout Screen

3.7.2.2 Input

This parameter sets the in-feed optional equipment. In the Input screen, use the up/down arrow keys to select the input option and press the enter key.

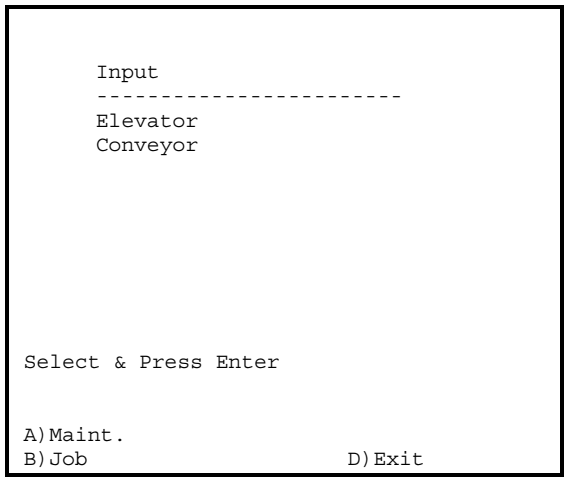


Figure 3-17. Input Screen

3.7.2.3 Knife Count

The Knife Count parameter allows the operator to reset the Knife Alarm and the Lube Alarm. The Knife Alarm displays a message to remind the operator to change knives. The Lube Alarm displays a message to remind the operator to have the machine lubricated.

Three functions are within the Knife Count parameter: Clear Count, Knife Alarm, and Clear Lube. To change the parameter, select it using the up/down arrow keys and press the enter key. The following sections explain each function.

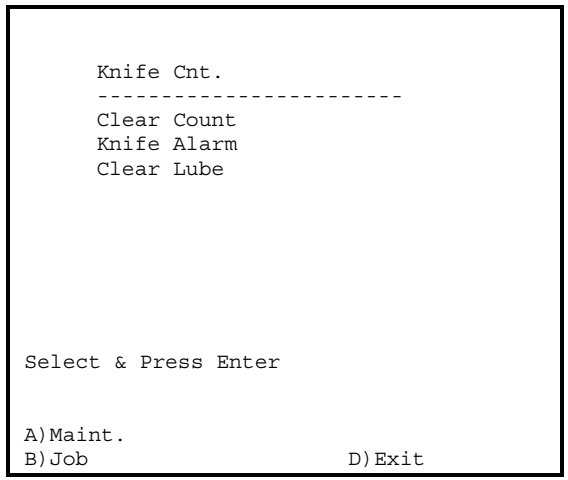


Figure 3-18. Knife Count Screen

Clear Count

Select Clear Count to reset the knife counter after the knives are changed.

Knife Alarm

Select Knife Alarm to change the knife stroke alarm value. When this value is reached, the display will alert the operator to change the knives and reset the knife counter. Knife alarm values are factory set at 5000 cuts; however, this value can be changed to meet specific application needs.

Clear Lube

Select Clear Lube to reset the Lube Alarm after lubricating the machine. The alarm will activate after ten times the knife alarm value. Contact an authorized service agent to lubricate the machine.

3.7.2.4 Machine Count

Machine Count displays the total number of cuts made by the machine.

3.7.3 Service

The service screen is helpful to when trouble-shooting a machine malfunction or fine-tuning its operation. Use the up/down arrow keys to select the appropriate parameter and press the enter key. The following sections describe each service parameter.

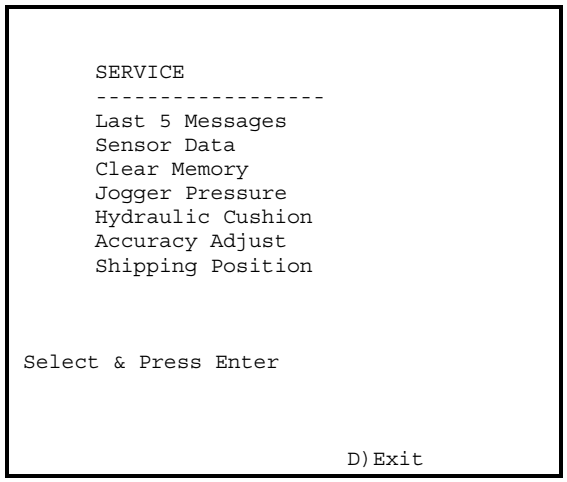


Figure 3-19. Service Screen

3.7.3.1 Last 5 Messages

The Last 5 Messages function displays the last five status messages that were displayed. It stores machine faults and is accessed by a service technician when a problem cannot be reproduced.

3.7.3.2 Sensor Data

The Sensor Data function provides a list of the computer inputs (proximity switches, etc..). This function allows a service technician to check the status of a switch as seen by the CMT controller board. Operation of the machine is prohibited in this mode, so each input must be actuated manually. An audio beep is heard each time a sensor is actuated.

3.7.3.3 Clear Memory

The Clear Memory function resets the memory. **All jobs are deleted!**

3.7.3.4 Jogger Pressure

The jogger is controlled by an electrically variable air pressure valve. The pressure should be set so it will not crush a 0.1" (2.5 mm) thick book.

Adjustment Procedure

1. Enter the jogger pressure setup mode from the Service Screen.
2. Place a minimum thickness book at the jogger station.
3. Press the up/down arrow key until appropriate pressure is obtained.
4. Leaving the menu jogs once. Re-enter the menu to set the pressure again.

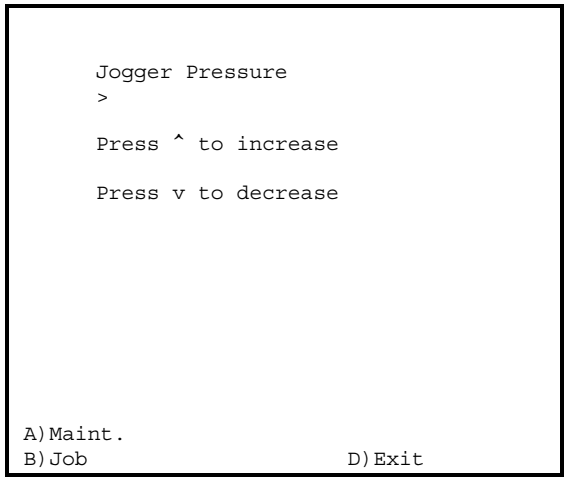


Figure 3-20. Jogger Pressure Adjust Screen

3.7.3.5 Hydraulic Cushion

The Hydraulic Cushion screen allows adjustment of the slow down speed at the bottom of the knife stroke. It primary function is to soften the impact when the hydraulics changes direction. It can reduce noise and wear and tear on the machine. To increase the speed (impact is harder), press the up arrow. To decrease the speed (impact is softer), press the down arrow.

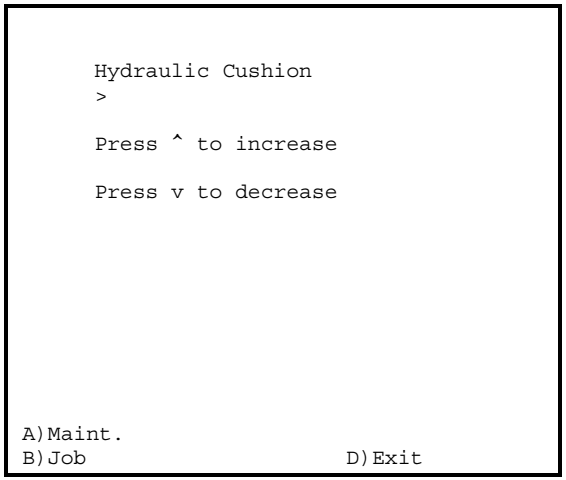


Figure 3-21. Hydraulic Cushion Screen

3.7.3.6 Accuracy Adjust

This screen shown in Figure 3-22 allows all accuracy dimensions to be adjusted simultaneously.

Adjustment Procedure

1. Empty the right side waste bin.
2. Select the Accuracy Adjust option from the Service menu, press the send key. The side knives and side guide will adjust to an uncompensated 9 X 6 with a .5" trim.

3. Cut a book, that is at least 10.00” X 7.00” and 0.25” thick.
4. Collect the right side trimming from the waste bin.
5. Measure the trim and the book size as accurately as possible, preferably with calipers accurate to .001”.
6. Enter these dimensions into the accuracy adjust screen.
7. Exit the Maintenance Mode and Send the side knives and side guide to a new location.
8. Cut a book.
9. Measure the book and side trim to verify they are accurate. If the book does not measure as expected, repeat steps 1 through 9.

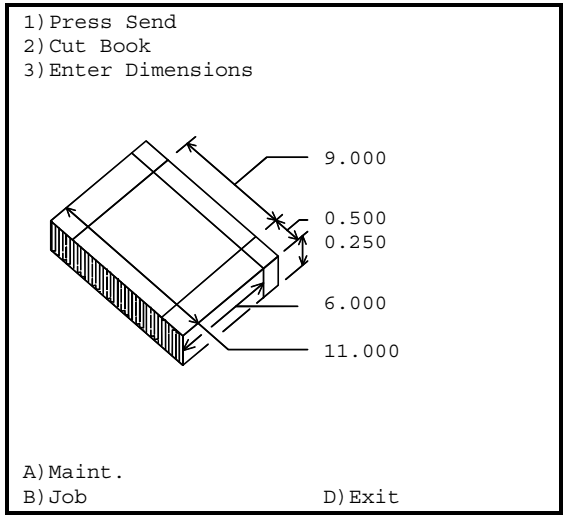


Figure 3-22. Accuracy Adjust Screen

3.7.3.7 Shipping Position

This function allows both the side and the face knives to be slowly lowered to a position approximately 1/2” off the table. This is done to prevent damage to the hydraulic system caused by dynamic forces during shipment.

Select Shipping Position from the Service screen and press the green start button.

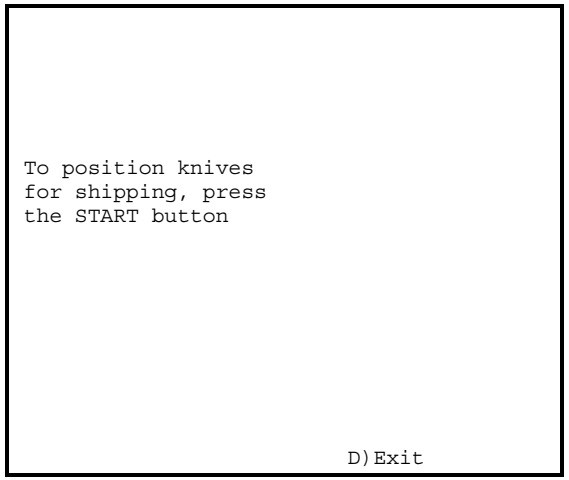


Figure 3-23. Shipping Position Screen

3.7.3.8 Language

In the Language screen, use the up/down arrow keys to select the appropriate language then press the enter key. All messages will be displayed in the selected language.

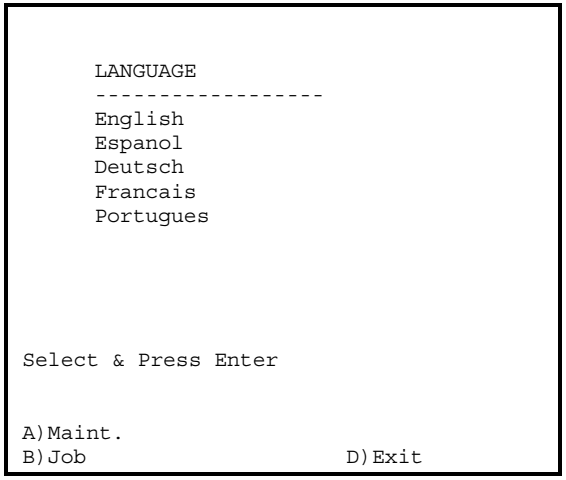


Figure 3-24. Language Screen

3.8 Status Messages

Message	Description
`^ WASTE BIN FULL`	The face knife waste bin sensor is covered.
`< WASTE BIN FULL`	The right side waste bin sensor is covered.
`> WASTE BIN FULL`	The left side waste bin sensor is covered.
`Book jam between CMT-330 and elevator`	Book was covering upper elevator sensor when the book was trying to lift.
`Book elevator FAILED to lift to the proper level`	The shelf level proximity sensor did not activate properly or in time. This con be caused by either a misadjusted or a faulty proximity sensor.
`Center clamp error Down when it should be up`	The proximity sensor on the center clamp did not turn on. This fault can be caused by either the air cylinder not returning or a faulty proximity sensor.
`Center clamp error Up when it should be down`	The proximity sensor on the center clamp did not turn off. This fault can be caused by either the air cylinder not coming down or a faulty proximity sensor.
`Clamp/knife down`	The side knife was down while the side knives or registration assembly was moving.
`DATA IS OUT OF RANGE`	This error message displays when the operator tries to send either the knives or the registration assembly to a position that is out of range.
`Elevator book jam. Check book in elevator sensor.`	Book did not clear the sensor in time.
`F-knife latch error OFF when it should be ON`	The face knife latch proximity did not activate. This can be caused by a misadjusted or faulty sensor, or the the air cylinder did not pull in.
`F-knife latch error ON when it should be OFF`	The face knife latch proximity sensor did not de-activate. This can be caused by a misadjusted or faulty proximity sensor, or the air cylinder did not extend.
`F-Knife at down limit failed to move`	This message displays when the face knife fails to leave the down proximity sensor. It may be caused by either the cut valve not de-energizing or a faulty down limit proximity sensor.
`F-Knife at up limit, Failed to move`	This message displays when the face knife fails to leave the up proximity sensor. There are four possible reasons for this failure: The dump valve did not energize, the hydraulic cushion valve did not energize, the knife down valve did not energize, or the side knife up proximity is faulty.
`F-Knife down FAILURE timed out before reaching down limit`	This message displays when the face knife leaves the up limit but does not reach the down limit in time. If the knife went down, the proximity sensor is either faulty or misadjusted. If the knives only moved down slightly, either the dump valve or the proportional valve may not have energized.
`F-Knife up FAILURE timed out before reaching up limit`	This message displays when the face knife does not reach the up limit in time. The proximity sensor is either misadjusted or faulty.
`F-Slow down Failure`	The slow down proximity sensor did not respond before the down proximity sensor. The face knife slow down proximity sensor is either misadjusted or faulty.

Status Messages Continued.

Message	Description
Input jam. Book was lost between binder & elevator	A book was detected on the in-feed conveyor but did not reach the elevator.
Input JAM Conveyor and Lift sensors are active	Both the proximity sensors on the elevator and on the input conveyor were on for more than three seconds.
Input door open	A door on either the Tilt In-feed conveyor or the Elevator is open, or the interlock circuit is open.
Jogger error! OUT when it should be IN	Jogger cylinder was out when it should have been in. Output 18 is off but input 12 shows jogger extended.
Jogger error! IN when it should be OUT	Jogger cylinder was in when it should have been out. Output 18 is on but input 12 shows jogger retracted.
Lost book in machine	The book proximity sensor deactivated during a cycle. The book may not have been gripped properly due to bad feeding. Stray pieces of scrap may also cause this error.
Lower door is Open	One of the three waste bin doors is open.
Lubricate Machine	The number of machine cycles has exceeded that which is recommended for lubrication. It is time to lubricate the machine.
Memory failed	One of the four EEPROM chips on the CMT controller board is faulty.
Motor starter error! ON when it should be off	Motor starter was on when it should have been off. Output 11 off with output 24 on.
Motor starter error! OFF when it should be off	Motor starter was off when it should have been on. Output 11 on with output 24 off.
NO Air Pressure	This error message displays when the air pressure falls below 20 PSI (1.4 Bar).
Number outside limit	The value entered is not valid.
OUTPUT CONVEYOR FULL	The output conveyor proximity sensor is covered.
Positioning error	This message displays after three failed attempts are made to position either the side knives or the registration assembly. It may be caused by a faulty drive motor, faulty encoder, or a loose connection between the motor and the lead screw.
Result is negative	This warning displays when a calculated result is a negative value.
Send canceled!	This message is displayed when a key is pressed while the side knives or registration assembly is moving.
Servo Disabled	This message is given when the hydraulic motor is off and the gripper is issued a move command. It is typically caused by pressing the stop button in the middle of a book cycle.
Sharpen Knife	The number of machine cycles has exceeded that which is recommended for a knife change. It is time to change knives.
Shorted Key error	A key on the keypad has been actuated for more than 90 seconds.
Side knife latch failed to disengage	The side knife latch proximity sensor did not activate. This can be caused by a faulty or misadjusted proximity sensor. The air cylinder may have failed to pull in.
S-knife latch error OFF when it should be ON	The side knife latch proximity did not activate. This can be caused by a faulty or misadjusted proximity sensor. The air cylinder may have failed to pull in.

Status Messages Continued.

Message	Description
S-knife latch error ON when it should be OFF	The side knife latch proximity sensor did not de-activate. This can be caused be a faulty sensor. The air cylinder may have failed to extend.
S-Knife at down limit Failed to move	This error message displays when the side knives do not leave the down proximity switch. Either the cut valve did not de-energize, or the down limit proximity sensor may be faulty.
Serial Communication Port Failed	The external control port is not working properly.
Serial error no response from the servomotor	The servo control port is not working properly.
Servo Port Failed	RS-232 port controlling the servo drive failed.
Servo Relay Error! ON when it should be off	Output 11 is off and input 23 is on.
Servo Relay Error! OFF when it should be on	Output 11 is on and input 23 is off.
S-Knife at up limit, Failed to move	This message is displayed when the side knives do not leave the up proximity sensor. There are at least four reasons for this failure: the dump valve did not energize, the proportional valve did not energize, the knife down valve did not energize, or the side knife up proximity sensor is faulty.
S-Knife down FAILURE timed out before reaching down limit	This message is displayed when the side knives leave the up limit but do not reach the down limit in time. If the knives did come down, the proximity sensor may be faulty or misadjusted. If the knives only moved down slightly, either the unload valve or the proportional valve may not have energized.
Start Button Held in at power up	Either the start button or remote cut button is being held in. Either button may be faulty.
S-Knife up FAILURE timed out before reaching up limit	This message displayed when the side knives do not reach the up limit in time. Either a faulty or misadjusted up proximity sensor may cause this error.
S-Slow down Failure	The slow down proximity did not respond before the down proximity sensor. Either a faulty or misadjust side knife slow down proximity sensor may cause this error.
Stop button pressed	Either a stop button is pressed or one is faulty.
Upper door is Open	One of the upper doors is open.

3.9 Example Job

This example will step through a typical in-line job. An in-line job uses the in-feed conveyor to accept books from a perfect binder. The in-feed conveyor transfers books into the elevator. The elevator feeds books into the trimmer. The trimmer then drops books onto the exit conveyor.

This example will trim a 1" thick, 9" x 12" book to 8.5" x 11". The right side trim will be 1/4" as shown below.

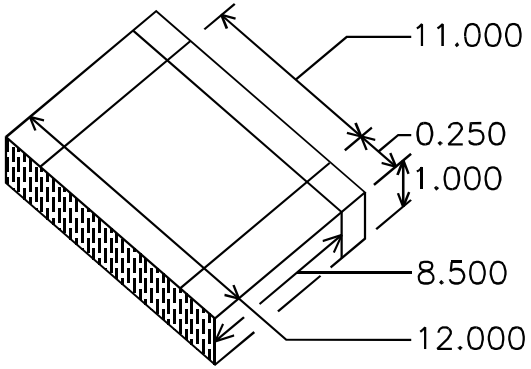


Figure 3-25. Example Book Dimensions

Preparation

Before books are printed, the document layout should be checked against the Book Size Chart on page 1-9.

Draw a vertical line, up from x=0.25 as shown in Figure 3-26. Draw a horizontal line, right from h=8.5. The lines intersect within the shaded region; therefore, the layout is acceptable.

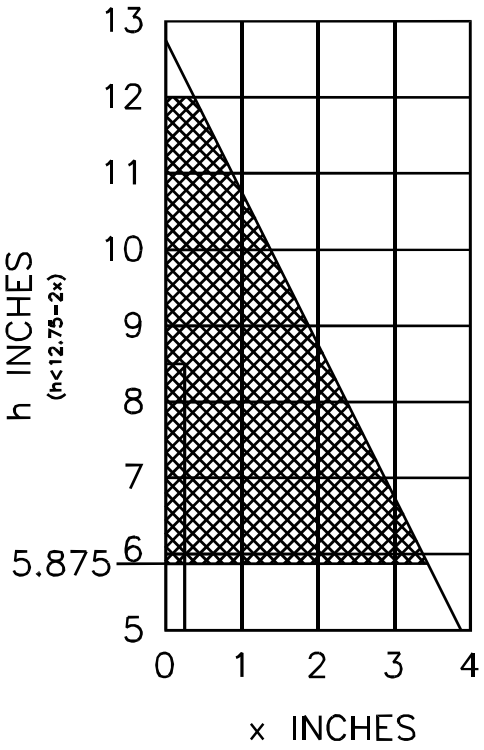


Figure 3-26. Book Chart

Program the Job

Switch on the trimmer. Allow a few seconds for the gripper to find home position. The screen will look similar to Figure 3-27.

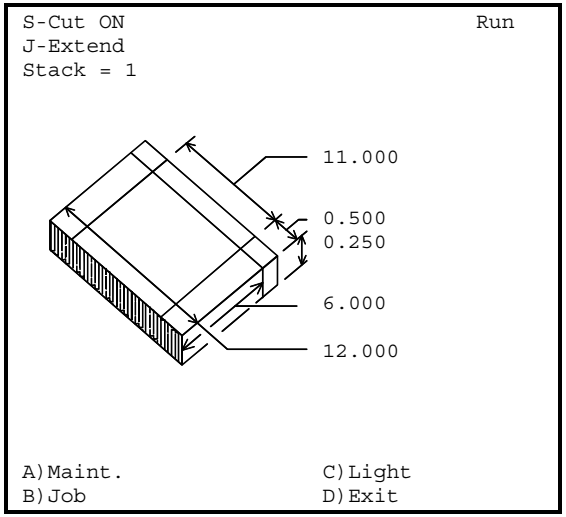


Figure 3-27. Example Start Screen

Press soft-key B to enter the Job screen. The display will look similar to Figure 3-28.

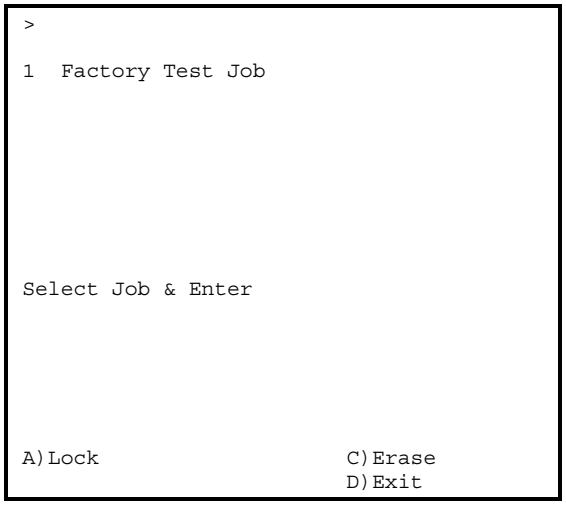


Figure 3-28. Job Screen

Create a new job number by typing a number from 2 to 99, then press the enter key. The screen will then look like Figure 3-29.

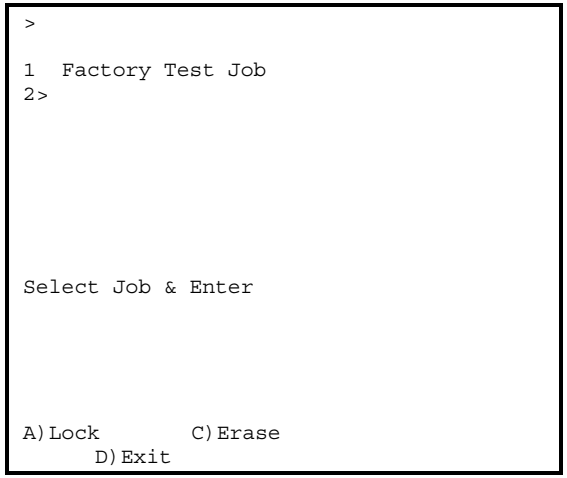


Figure 3-29. Job Number

Name the job. Use the right arrow key to move the cursor at least one space to the right. Use the up/down arrow keys to cycle through the alphabet. After arriving at the desired letter, symbol, or number, press the right arrow key to move to the next character field. Continue until the name is complete. The screen looks similar to Figure 3-30.

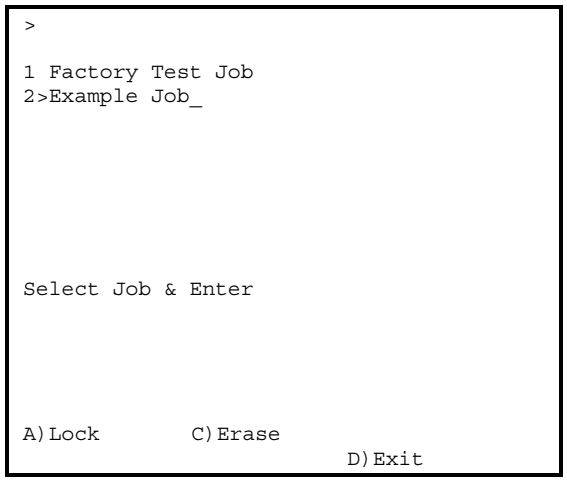


Figure 3-30. Job Name

After the job has been named, press the enter key to enter the book dimensions into the job. The screen looks similar to Figure 3-31.

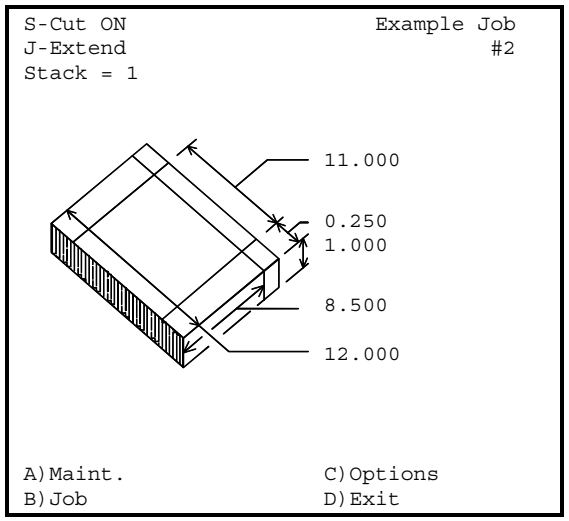


Figure 3-31. Job Run Screen

After all values have been entered, press the send key. The side knives will move into position followed by the registration assembly.

The job can now run. Before running books through the binder, press and hold the green start button on the console. Release the button when the hydraulics and conveyors start. Begin running books.

3.10 Serial Data

(Under Development)

The CMT 330 is capable of serial communication with another computer.

Communication Parameters

Serial data is transferred under the following parameters:

Baud rate	9600
Data bits	8
Parity	None
Stop bits	1
Echo	on

Each received character is echoed back. If the CMT controller does not understand the data, “ERROR” is returned. An “OK” message is sent back to the host after each successful command transmission. If a command is sent while a book is in process, that command will not be executed until the book is complete

3.10.1 New Book Size Command

The New Book Size command is sent when the CMT 330 is in Serial Mode. All five dimensions must be sent.

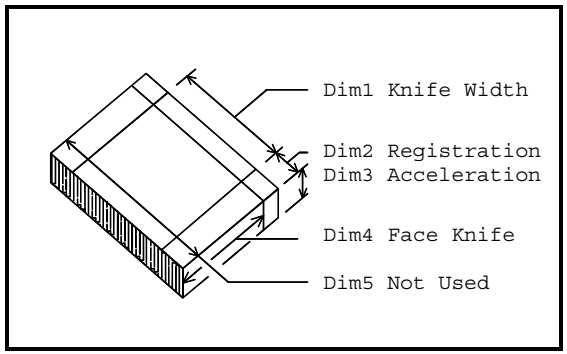


Figure 3-32. Transferred Data

Example

Dim1=9
Dim2=.25
Dim3=.2
Dim4=7
Dim5=10
!

(ASCII HEX)
31 3d 39 0d 0a
32 3d 2e 32 35 0d 0a
33 3d 2e 32 0d 0a
34 3d 37 0d 0a
35 3d 31 30 0d 0a
21

3.10.2 Command 1 (Send Command)

Sends knives and side guide to programmed position

C=1
!

(ASCII HEX)
43 3d 31 0d 0a
21

3.10.3 Command 2 (Stop Command)

Stops input conveyors
C=2
!

3.10.4 Command 3 (Reset Book count)

Resets book count back to 0

C=3
!

3.10.5 Other commands

The following commands are not yet available but are provided for informational purposes.

3.10.5.1 Job change

The CMT 330 has 99 program locations. This command allows a new pre-programmed book size to be selected.

J=1
!

(ASCII HEX)
4a 3d 31 0d 0a
21

3.10.5.2 Book Count

The book count is sent from the CMT 330 at the end of each book.

Example

BK= 20

(ASCII HEX)
42 4b 3d 32 30 0d 0a

The CMT 330 sends back the book count after each book. Immediately after receiving the book count, a stop command should be sent. When the input conveyors are stopped, the new book size can be sent or a new job can be selected. A send command must be sent to set the knives and registration assembly. Once the machine is in position, the input conveyors will restart.

3.10.6 Example 1

This example stops input, selects JOB 2, and sends knives to job2 location.

C=2
!

J=2
!

C=1
!

3.10.7 Example 2

This example stops input, selects a 9 X 7 book with a .25” trim, and 0.2” thick then sends knives to location.

C=2
!

1=9
2=.25
3=.2
4=7
5=10
!

C=1
!

NOTES:

4 Routine Tasks

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4.2 Cut Stick / Cut Plates	4-2
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4.3.1 Knife Change	4-4
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4.5.1 Safety Check-off Sheet	4-10

Introduction

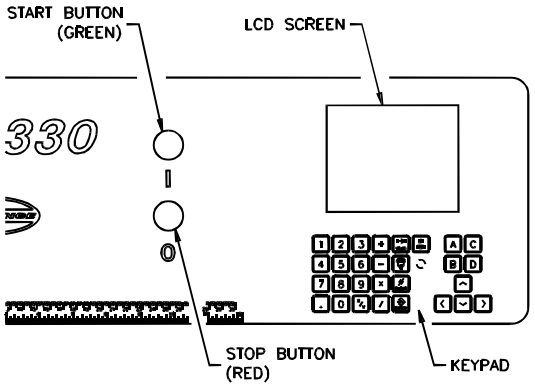
Certain tasks will be performed on a regular basis but not necessarily on a set schedule. The safety systems check, however, should be done before each shift. The waste bins must be emptied when full. The knives should be replaced when cut quality becomes unacceptable. Performing as many of these tasks before a shift begins prevents down time while a job is in progress and ensures safe operation of the machine.

4.1 Waste Bins

The three waste bins may actually require emptying in the middle of a shift, but it is a good idea to do it before a shift begins. When the waste bins are near capacity during a job run, the CMT 330 continues cutting. The status indicator light on top of the machine blinks slowly, and the screen displays a message stating that the waste bins are full.

Use the following procedure to change waste bins.

If running, stop the machine's cutting mode by pressing the red stop button on the console shown in



1. Figure 4-1. To preserve the status of each book in the job, press the stop button after the gripper transport releases a trimmed book, but before it clamps the next untrimmed book. If the untrimmed book is clamped by the gripper transport and not trimmed, it will be ejected onto the Exit Conveyor when the machine is restarted. The book can be manually placed onto the In-feed conveyor to be trimmed later.

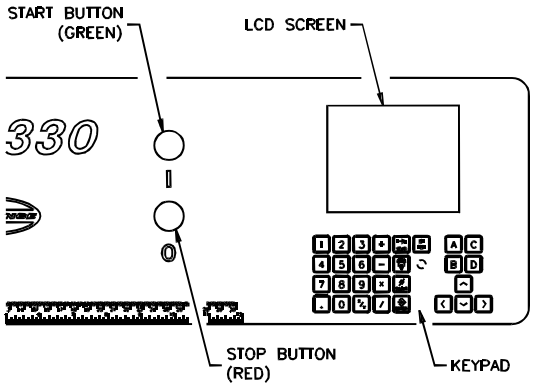


Figure 4-1. Stop Button Location

2. Wheel a cart to any of the three waste bin locations. One is located at both the rear, right-hand and left hand sides of the machine. The remaining waste bin is located at the back of the machine. Figure 4-2 and Figure 4-3 show the waste bin locations.

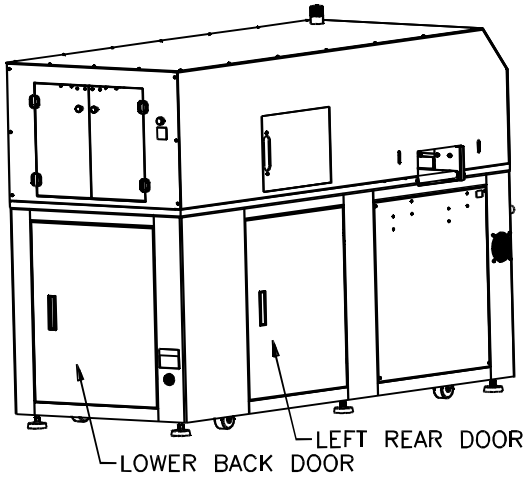


Figure 4-2. Waste Bin Locations

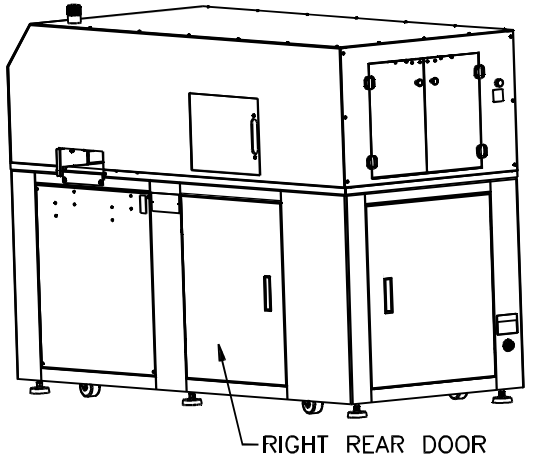


Figure 4-3. Waste Bin Location

3. Open a door. Tilt and lift the waste bin from the base of the machine.
4. Place the waste bins on the cart and repeat for the remaining bins.
5. After emptying and placing the bins back into the trimmer, close the doors securely. The machine will not operate if a door is ajar.

Hint! Static can accumulate on the plastic waste bins. This can occasionally cause trimmings to cling to the handles of the bin. The Bin Full sensor is at this location, so trimmings blocking the sensor will cause the Waste Bin Full status even if the bin is not full. To prevent this from happening, lightly spray the inside of each bin with an anti-static spray. This need only be done on occasion.

Using additional waste bins may reduce down time. To order additional waste bins, use Challenge part number, **56143**.

4.2 Cut Stick / Cut Plates

The cut stick and cut plates should either be changed or rotated with every knife change. They may also require changing at other times if

deep grooves or jagged edges can be seen along the score marks. Cut stick/plate wear effects cut quality.

4.2.1 Changing the Cut Stick

The cut stick can be rotated 8 times before disposal. It is located under the face knife, accessed through set of double doors at the back of the machine. The cut stick puller provided with the machine is used to remove the cut stick. The cut stick and other tools are located on the inside of the left rear door that is shown in Figure 4-2. The cut stick puller has a finger hold and hook as shown in Figure 4-4.

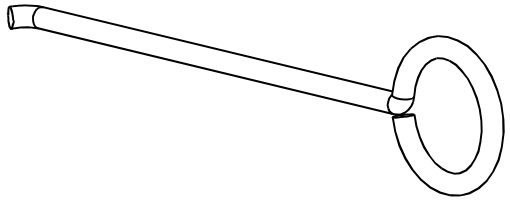


Figure 4-4. Cut Stick Puller

1. Switch off (**O**) main power at the front of the machine and lock out the main power disconnect switch as described in section 1.5 Power Lockout Procedure on page 1-4.
2. Open the set of double doors at the back of the machine.
3. Remove the black plastic waste chute from the table by lifting and tilting toward the outside of the machine.
4. Hook the Cut Stick Puller over one of the ends of the cut stick with a finger in the loop of the puller. Keep the Cut Stick Puller in-line with the cut stick.
5. Pull the Cut Stick Puller at a slight angle over the cut stick until the end of the cut stick comes out of the table.

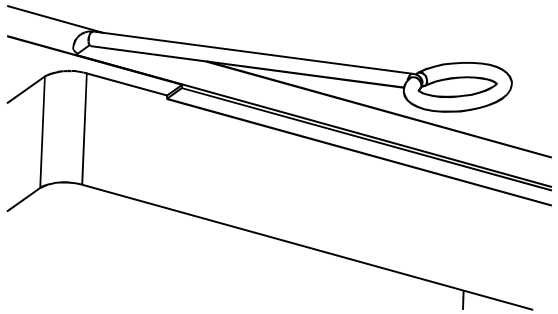


Figure 4-5. Pull at slight angle

6. Remove the remaining cut stick from the table by hand.
7. Inspect the cut stick for wear. It may be used 8 times (twice on each surface) before disposal. To use a surface twice, reinstall the cut stick by turning it such that end that came out of the right end of the slot goes into the left end of the slot. If a surface has been used twice, rotate the stick to an unused surface before reinstalling. If all (4) surfaces have been used twice, replace the stick with a new one.

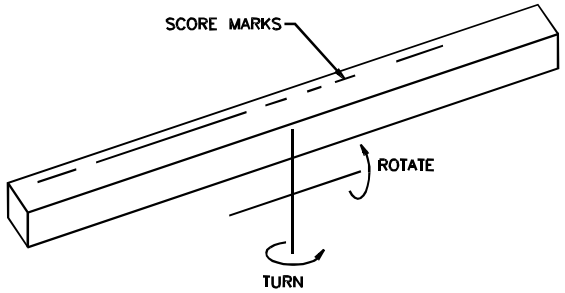


Figure 4-6. Cut Stick Rotation

8. Reinstall the waste chute.
9. Securely close the set of double doors at the back of the machine.
10. Unlock the main power disconnect and resume operation.

Refer to section 1.6.2 Standard Accessories to obtain the part number for replacement cut sticks.

4.2.2 Changing the Cut Plates

The cut plates can be rotated once before disposal. One is located underneath each side knife. They are accessed by opening the sliding doors on each side of the machine. A flat screwdriver is helpful but not necessary when removing cut plates.

1. Send the book height cutting dimension to 6 inches so the side knives move to the center of the machine.
2. Switch off (**O**) main power at the front of the machine and lock out the main power disconnect switch as described in section 1.5 Power Lockout Procedure on page 1-4.
3. Open a sliding door on either the left or right side of the machine.
4. Remove the black plastic waste chute from the table by lifting and tilting toward the outside of the machine.
5. Lift and wiggle the edge of the cut plate until it slides off the four pins in the table. Alternatively, slide the end of a screwdriver between the slot in the table and the cut plate. Rock the screwdriver. Alternate between each of the two slots until the cut plate is free. Figure 4-7 shows the location of the slots.

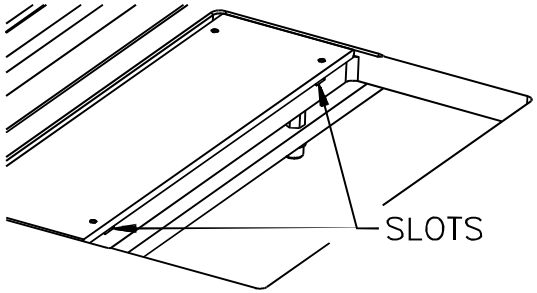


Figure 4-7. Slots Under Cut Plates

6. Inspect the cut plate for wear. It may be used two times (once on each surface) before disposal. If only one side of the plate is used, turn the plate over and reinstall it with the smooth side up. Replace the cut plate with a new one if both sides are used.
7. Reinstall the waste chute.
8. Securely close the double doors at the back of the machine.
9. Repeat steps 3 through 8 with the remaining cut plate.
10. Unlock the main power disconnect and resume operation.

Refer to section 1.6.2 Standard Accessories to obtain the part number for replacement cut plates.

Hint! Depending on what locations on the cut plates are most worn, they may be able to be rotated 180° before they are turned over. By using this method of rotation, each cut plate may be used four times.

Hint! Save your old cut plates to use when trimming out of the ordinary sizes.

4.3 Knives

The knives should be changed when cut quality becomes unacceptable. By default, the computer will issue a Sharpen Knife alarm after 2500 cuts. This is a good general-purpose value, but the most appropriate number will vary depending on the type of paper stock being cut. Refer to the Operator's Guide for instructions on changing the value for the Sharpen Knife alarm.

CAUTION

The knives must be adjusted after every knife change. Improper knife adjustment may cause damage to the machine.

4.3.1 Knife Change

A stable rolling cart, approximately 36" tall, the knife lifter, the T-handle hex wrench, an empty scabbard, and a set of sharp knives are required to perform a knife change.

CAUTION

All three knives are a set. They must be sharpened as a set. Damage or poor performance may result if knives are not from the same set.

WARNING

Changing knives can be very dangerous unless safety precautions are observed and extreme care is taken when handling knives. Keep handling of unprotected knives to an absolute minimum. Have the scabbard nearby and insert knife immediately. Warn people of any unprotected knife.

WARNING

Knife changing is a ONE PERSON OPERATION! More than one person changing a knife creates safety hazards.

WARNING

Even used knives are extremely sharp! Use extreme care when handling new/re-ground knives and used knives.

The following procedure should be used to change knives.

1. Switch off (**O**) main power at the front of the machine and lock out the main power disconnect switch as described in section 1.5 Power Lockout Procedure on page 1-4.
2. Place three empty scabbards on the rolling cart. The knives may be removed or installed in any order.
3. The knives are located behind the plastic doors shown in Figure 4-8 and Figure 4-9.

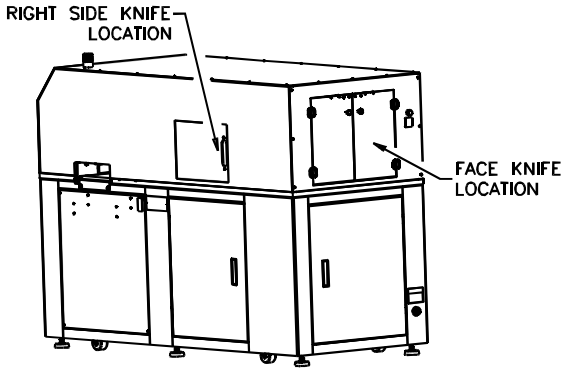


Figure 4-8. Knife Locations

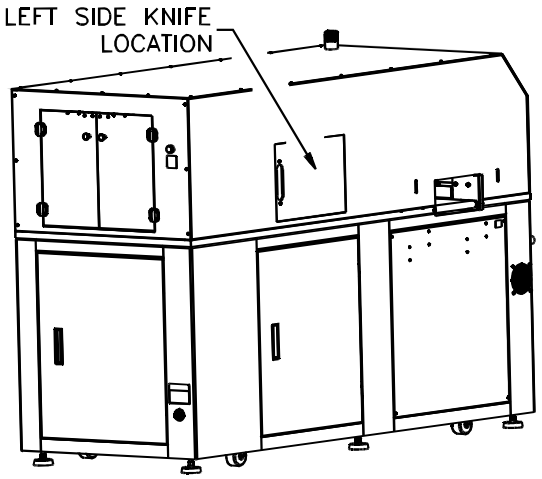


Figure 4-9. Left Side Knife Location

4. Open the door and remove the waste chute to access the knife.
5. Using the T-handle hex wrench, remove the **two** knife bolts that are in open slots in the knife bar. They are the second and fifth bolts from either end of the knife. Set the bolts aside and save for knife installation.

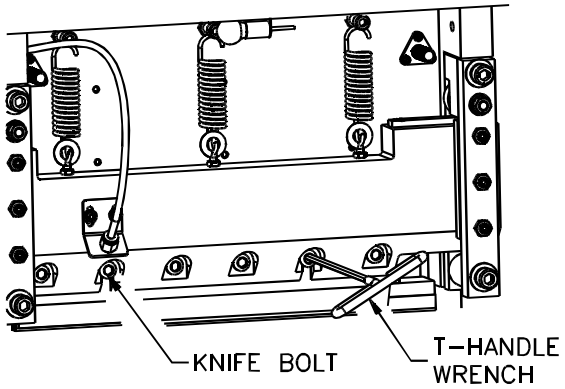


Figure 4-10. Knife Bolt Locations

6. Place the knife lifter on top of the knife bar and align each lifter handle with the holes from which the two knife bolts were removed in the previous step. Turn the handles clockwise until the lifter is securely fastened to the knife bar as in Figure 4-11.

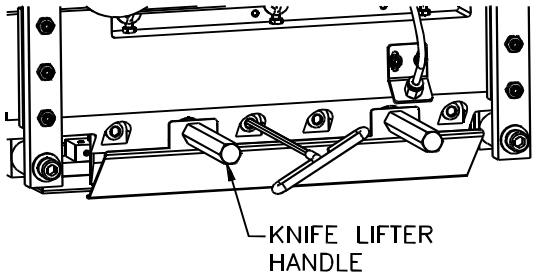


Figure 4-11. Knife Removal

7. Use the T-handle wrench to remove the remaining (4) knife bolts. Save the bolts with the two previously removed.

WARNING

Make certain to have a scabbard on the cart, prepared to receive a knife. The screws should be removed from the scabbard. The protecting edge of the scabbard should be facing the person changing the knife when he is placing the knife in it. Make sure the cart is nearby. Do not carry the knife across obstructed or slippery floors. Warn people nearby that a knife is being removed.

8. Slowly turn the knife lifter handles counterclockwise only until the knife is released from the machine. DO NOT turn the handles any more than what is required to free the knife.
9. When the knife is free, move it down and clear of the knife bar.
10. Hold the knife lifter with knife at a safe distance from the body. Other people should not be nearby. Carry the lifter to the cart containing the prepared scabbard.
11. Place the knife lifter with knife into the scabbard such that the edge of the knife is in the scabbard slot.
12. Carefully turn the knife lifter handles counterclockwise and disconnect the lifter from the knife while the knife-edge remains in the scabbard slot.
13. Align the two knife-bolt holes with the holes in the scabbard such that no portion of the knife-edge remains exposed.
14. Place a scabbard screw into each hole and turn them clockwise to tighten.
15. Use a wrench to secure the knife to its scabbard.
16. Set the knife aside.
17. Repeat steps 4 through 16 with the remainder of the knives.

With all knives removed, the replacement knives may be installed.

CAUTION

All three knives are a set. They must be sharpened as a set. Damage or poor performance may result if knives are not from the same set.

WARNING

Changing knives can be very dangerous unless safety precautions are observed and extreme care is taken when handling knives. Keep handling of unprotected knives to an absolute minimum. Have the scabbard nearby and insert knife immediately. Warn people of any unprotected knife.

WARNING

Knife changing is a ONE PERSON OPERATION! More than one person changing a knife creates safety hazards.

WARNING

Even used knives are extremely sharp! Use extreme care when handling new/re-ground knives and used knives.

18. Make sure main power is still turned off (**O**) at the front of the machine and is locked out at the main power disconnect switch as described in section 1.5 Power Lockout Procedure on page 1-4. Make sure all the waste chutes are still removed from the machine.
19. **Turn both knife depth adjustment handles clockwise until they stop**. They are accessed through the rear, left sliding door and back double doors.

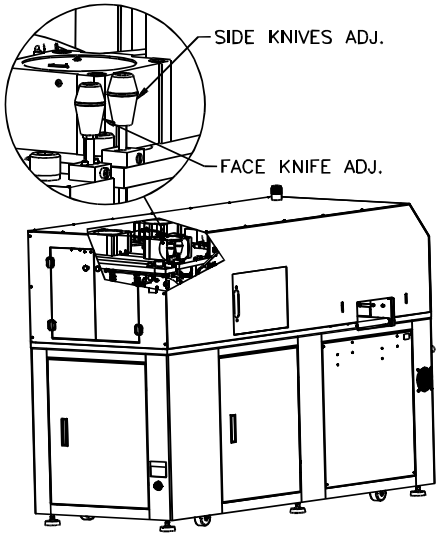


Figure 4-12. Knife Adjustment Knobs

20. Place a scabbard containing a replacement knife on the cart. Move the cart as close as possible to where the knife is to be installed. The knives may be installed in any order.
21. After the cart is located, make sure the scabbard containing the replacement knife has its protected edge facing the installer. Have the knife lifter nearby.
22. Carefully remove the two screws that fasten the knife to its scabbard.
23. Place the knife lifter on the knife and align the left handle with the second hole from the left end of the knife.
24. Align the right handle with the second hole from the right end of the knife.
25. Turn the lifter handles clockwise until the ends of the handles touch the scabbard under the knife.
26. Turn the handles counterclockwise 1/2 turn so the ends of the handles will not interfere with the clamp inside the machine.
27. Hold the knife lifter with knife at a safe distance from the body. Other people should not be nearby. Carry the lifter to the installation location.
28. Place the knife behind the knife bar while aligning the lifter handles to the open bolt slots in the knife bar as shown in Figure 4-13.

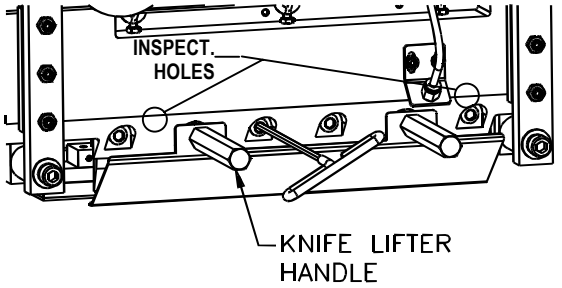


Figure 4-13. Knife Installation

29. Lift the knife into the knife bar such that the lifter handles are at the extreme top of the slot.

CAUTION

The knife lifter handles must be at the extreme top of the slot. If they are not, it will be difficult to adjust the cutting depth of the knives. Damage to the cut plates may result.

30. Turn the lifter handles clockwise and securely fasten the lifter and knife to the knife bar. Make certain the knife does not move down as the handles are tightened.
31. Place 4 knife bolts into the 4 available holes in the knife and use the T-handle wrench to secure them as shown in Figure 4-13.
32. Turn the lifter handles counterclockwise and remove the lifter from the machine.
33. Place 2 knife bolts into the holes from which the knife lifter handles were removed. Use the T-handle wrench to secure them. Viewed through the inspection holes, the blade should be inserted against the stops.
34. Repeat steps 18 through 33 to install the remaining two knives.

Once the knives have been installed, they must be adjusted.

4.3.2 Knife Adjustment

The knives require adjustment after every knife change. The face knife is adjusted independently from the side knives. The side knives are adjusted simultaneously. To properly adjust the side knives, the side knives must be properly installed. They should have been installed to the top of the slots of the knife bar. If one side knife cuts through and the other does not, the knives were not properly installed.

Use the following procedure to adjust the depth at which the knives cut. Scrap or extra books are recommended for use when adjusting the knives. No tools are needed.

WARNING

Knife adjustment is a ONE PERSON OPERATION! More than one person adjusting the knives creates safety hazards.

Face Knife Adjustment

1. Select A at the console to enter maintenance mode and choose Knife Adjust.
2. Open the set of double doors at the back of the machine.
3. Remove the waste chute by lifting it and pulling it toward the outside of the machine.
4. Find the face knife adjustment knob in the upper right-hand corner of the opening as shown in Figure 4-14.

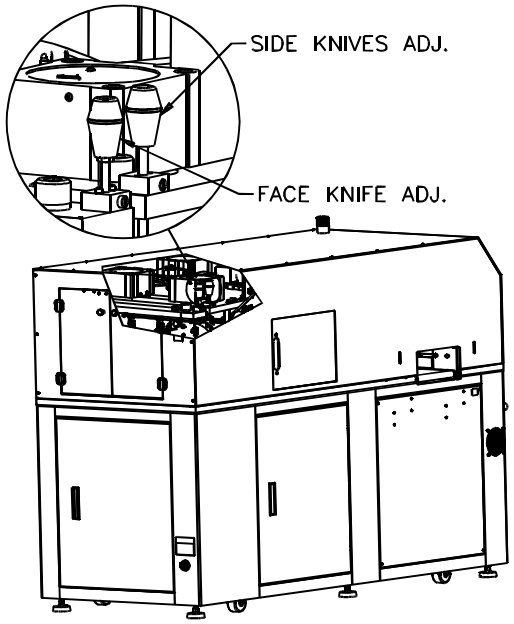


Figure 4-14. Knife Adjustment Knobs

5. If the knives were just replaced, the face knife adjustment knob should be turned to the full down position. If it is not, do so by turning the knob clockwise until it stops.
6. Turn the face knife adjustment knob back out about three full revolutions counterclockwise.
7. Place the face side of a scrap book underneath the knife with the binding facing the inside of the machine.
8. Securely close the set of double doors.
9. Press and hold the green button on the right-hand side of the double doors. The hydraulic motor turns on, and in about 1 second, the machine cuts the book.
10. Open the set of double doors and check the book. If the bottom cover of the book is not fully cut. Turn the face knife adjustment knob 1/4 revolution counterclockwise. Repeat steps 7 through 10 until the bottom cover is cut fully. All doors must be closed for the machine to cut.
11. Now complete the Side Knife Adjustment procedure.

Side Knife Adjustment

1. The computer should still be in Knife Adjust mode.
2. If the knives were just replaced, the side knives adjustment knob should be turned to the full down position. If it is not, do so by turning the knob clockwise until it stops.
3. Turn the side knives adjustment knob about three full revolutions counterclockwise.
4. Securely close the doors.
5. Open the sliding door at the left-hand rear of the machine. Place a scrap book underneath the knife with the binding facing the front of the machine.
6. Securely close the sliding door.
7. Press and hold the green button until the machine cuts the book. If the bottom cover and binding of the book are not fully cut, turn the side knives adjustment knob 1/4 revolution counterclockwise and repeat steps 5 through 7. All doors must be closed for the machine to cut. Continue with the next step if the book is fully cut.

8. Open the sliding door at the right rear-hand side of the machine.
9. Place a book under the knife with the binding facing the front of the machine.
10. Securely close the sliding door.
11. Press and hold the green button on the right-hand side of the double doors at the back of the machine until the book is cut. If the bottom cover and binding are not fully cut, turn the side knives adjustment knob 1/4 revolution counter-clockwise and repeat steps 8 through 11. All doors must be closed for the machine to cut. If the book is fully cut, the knife adjustment procedure is complete.
12. Reinstall all waste chutes.
13. Securely close all doors and resume normal operation at the console.

4.3.3 Knife Sharpening Rules

The CMT 330's knives **must** be sharpened as a matching set. A total of 1/4" (6.4mm) of material may be removed due to grinding. Beyond this, the machine will not fully cut through a book.

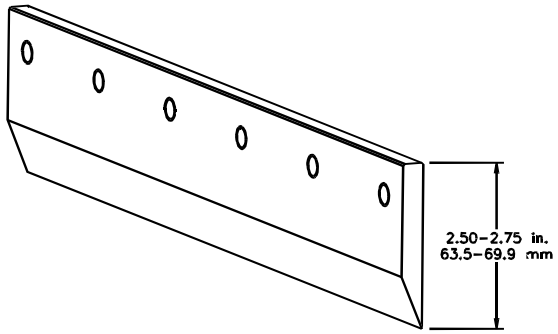


Figure 4-15. Knife Height Range

The knives must **not** be sharpened to less than 2.50 in. (63.5 mm) of knife height as shown in Figure 4-15.

4.4 Check Pressure Switch

The main air pressure switch should be checked for proper operation each month. The main air pressure switch is used to verify that main air is connected and switched on. If this switch fails, damage to the machine could result.

1. Switch on power, open lower back door.
2. Switch off main air valve.
3. Close the door.
4. Go to the console and read the LCD display. The message, "No air pressure," should be displayed.
5. Open lower back door.
6. Switch on main air valve.
7. Close the door.
8. Go to the console and read the LCD display. The message, "No air pressure," should not be displayed.

4.5 Safety Systems Check

Test Frequency: **Daily**

CAUTION

Only one person should perform this test at a time.

Use the following procedures to test the safety devices throughout the machine. If the machine fails any safety system test, DO NOT USE the machine. Have the machine serviced by an authorized service technician.

Console Stop Button:

1. Switch on the main power.
2. Press the green start button at the console to start the hydraulic motor.
3. Press the clear button, and wait for the machine to reset itself.
4. Press the red stop button at the console. The hydraulic motor should shut off.

Knife Change Operator Stop Button:

1. Press the green start button at the console to start the hydraulic motor.
2. Press the red stop button at the back of the machine. The hydraulic motor should shut off.

Front Sliding Door Interlock:

1. Press the green start button at the console to start the hydraulic motor.
2. Open the front sliding door. The hydraulic motor should shut off.
3. Close the door.

Right rear Sliding Door Interlock:

1. Press the green start button at the console to start the hydraulic motor.
2. Open the right rear sliding door. The hydraulic motor should shut off.
3. Close the door.

Left rear Sliding Door Interlock:

1. Press the green start button at the console to start the hydraulic motor.
2. Open the left rear sliding door. The hydraulic motor should shut off.
3. Close the door.

Back Double Door Interlocks:

1. Press the green start button at the console to start the hydraulic motor.
2. Open the left-hand door in the set of double doors at the back of the machine. The hydraulic motor should shut off.
3. Close the door.
4. Press the green start button at the console to start the hydraulic motor.
5. Open the right-hand door in the set of double doors at the back of the machine. The hydraulic motor should shut off.

Right rear Door Interlock:

1. Press the green start button at the console to start the hydraulic motor.
2. Open the right rear door. The hydraulic motor should shut off.
3. Close the door.

Left rear Door Interlock:

1. Press the green start button at the console to start the hydraulic motor.
2. Open the left rear door. The hydraulic motor should shut off.
3. Close the door.

Lower Back Door Interlock:

1. Press the green start button at the console to start the hydraulic motor.
2. Open the lower back door. The hydraulic motor should shut off.
3. Close the door.

Use the table on the following page to record the initials of the person performing the tests and the date the tests are performed. Make photocopies of the check-off sheet as necessary.

4.5.1 Safety Check-off Sheet

Use this sheet to sign tester's initials and test dates for performing the Safety Systems Check on page 4-9 of the Installation and Operator's Manual.

Machine Model: **CMT 330**

Serial Number:_____

TESTER	DATE	TESTER	DATE	TESTER	DATE

5 Book Quality

Section Contents

TITLE	PAGE
5.1 Burr Marks	5-2
5.2 Jagged Bottom Cover	5-2
5.3 Burr Marks/Jagged Cover	5-2
5.4 Rectangular Crease Lines	5-3
5.5 Linear Crease Lines	5-3
5.6 Draw	5-3
5.7 All Sheets Not Cut	5-4
5.8 Book Not Square	5-4

Introduction

Operators may occasionally need to trouble-shoot book quality issues. These quality issues are addressed by either changing machine settings or replacing knives. Machine settings may require adjustment to be compatible with the type of paper and cover being used. Knives and cut sticks/cut plates may require replacement because they are consumable items.

Other quality issues such as accuracy and square should be referred to an authorized technician because they involve service repairs or adjustments, which are outside the scope of an operator's training.

5.1 Burr Marks

Description

Burr marks are found on books cut with a knife whose cutting edge has been burred. Figure 5-1 illustrates the appearance of burr marks.

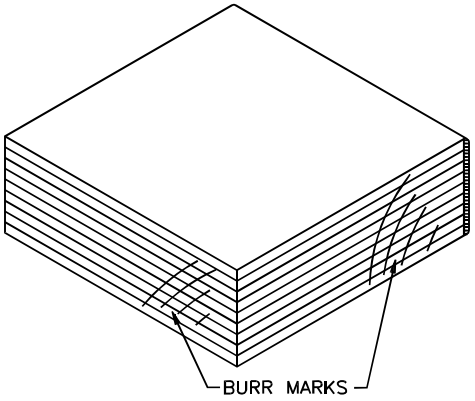


Figure 5-1. Burr Marks

Possible Causes

1. Burrs on knives can occur from improper knife handling.
2. Burrs may also occur from cutting hard, irregular materials.

Solutions

- If the any knife is burred, replace all three knives and maintain as a set.

CAUTION

All three knives must be sharpened as a set. Damage to the cut plates may result from using knives sharpened separately.

5.2 Jagged Bottom Cover

Description

Books can appear as though the bottom few sheets and cover were torn apart rather than sharply cut. Tearing of the bottom sheets and cover occur when deep score marks develop in the cut stick or cut plates. The cover is pushed into the score mark, folded over and torn.

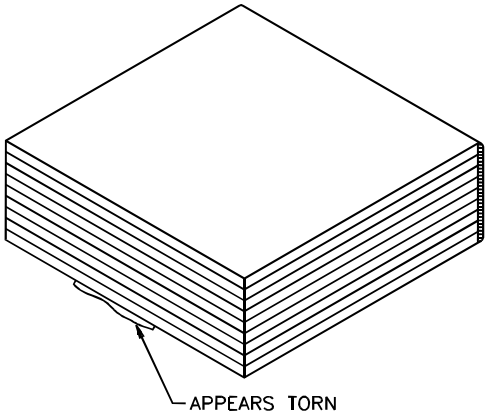


Figure 5-2. Jagged Cover

Possible Causes

1. The knife may be dull.
2. The cut stick/cut plates may be worn.

Solutions

- If the problem is on the face of the book, the cut stick may need rotation or replacement. The knives may also require replacement.
- If the problem is on the top or bottom faces of the book, the cut plates may need rotation or replacement. The knives may also require replacement.

5.3 Burr Marks/Jagged Cover

Description

A jagged bottom cover may also accompany burr marks. A burred knife may not fully cut into the cut stick or cut plate. As a result, it will leave a jaggedly cut bottom cover.

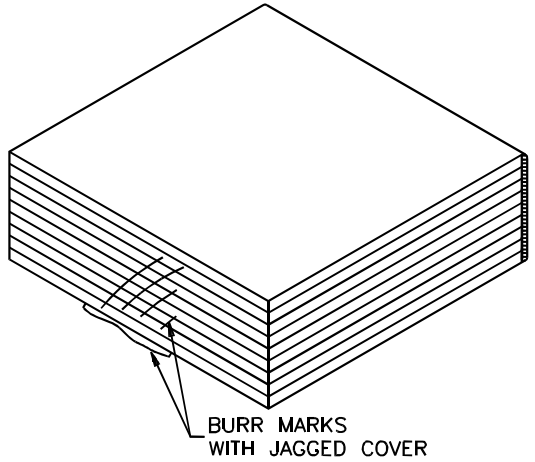


Figure 5-3. Burr Marks/Jagged Cover

Possible Causes

- The knife is burred, and the cut stick/cut plates are worn.

Solutions

- If the problem is on the face of the book, replace the knives. Rotate or replace the cut stick.
- If the problem is on the top or bottom faces of the book, replace the knives. Rotate or replace the cut plates.

5.4 Rectangular Crease Lines

Description

Indentations or crease lines may appear in a rectangular pattern in the center of the book.

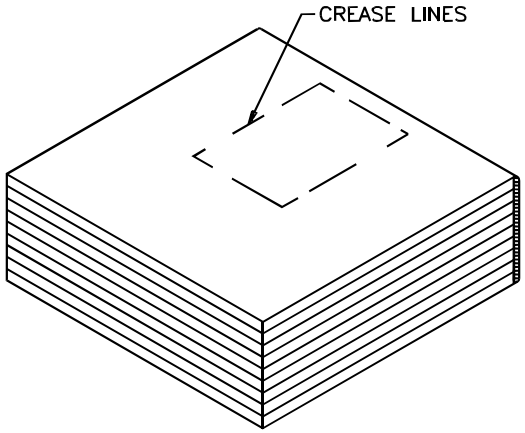


Figure 5-4. Crease Lines on Cover

Possible Causes

- The gripper has too much clamp pressure for the stock being cut.

Solutions

- Reduce the gripper clamp pressure by turning the control dial counterclockwise. Reduce the pressure until crease lines disappear on test books. The gripper adjustment gauge only reads gripper pressure while the gripper is holding the book.

5.5 Linear Crease Lines

Description

Indentations or crease lines may appear in a rectangular pattern in the near the edges of the book.

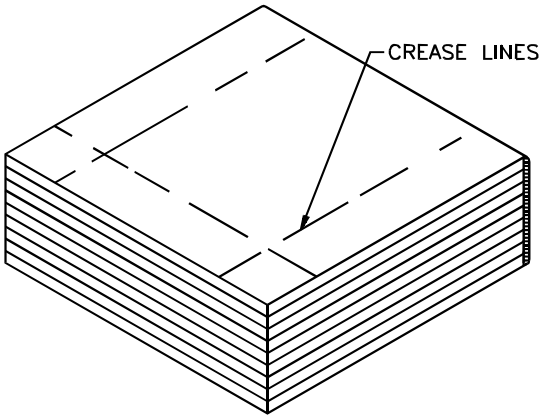


Figure 5-5. Linear Crease Lines

Possible Causes

- The clamps have too much clamp pressure for the stock being cut.

Solutions

- Reduce the clamp pressure by turning the control dial counterclockwise. Reduce the pressure until crease lines disappear on test books.
- Worn cut plates may create these lines on the bottom cover. Turn or change the cut plates.

Note: Reducing the clamp pressure too much will cause other quality problems such as draw. Only reduce clamp pressure by necessary amounts.

5.6 Draw

Description

The cut face appears to have a slope because all of the sheets are cut at different lengths.

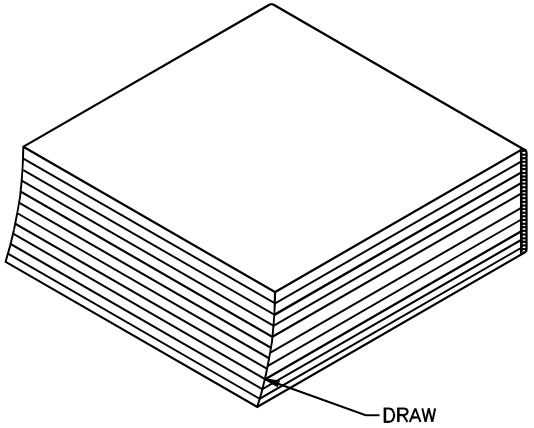


Figure 5-6. Draw

Possible Causes

- Clamp pressure may be too low.
- The knife may be dull.

Solutions

- Check clamp pressure. Clamp pressure should be 80-90 PSI. Turn control dial clockwise to increase clamp pressure. Make sure shop air is 80-90 PSI.
- If the problem is on the face of the book, replace all three knives. Rotate or replace the cut stick.
- If the problem is on the top or bottom faces of the book, replace the knives. Rotate or replace the cut plates.

5.7 All Sheets Not Cut

Description

Bottom sheets are not being cut.

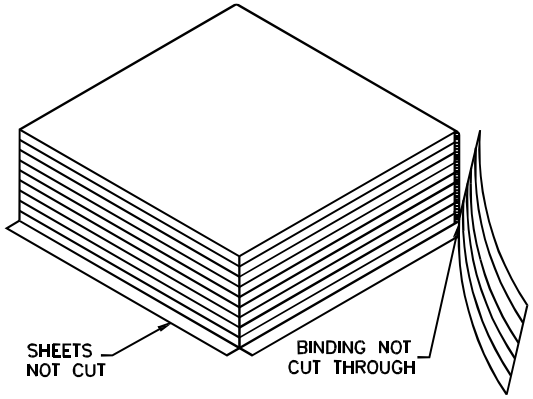


Figure 5-7. Not Cutting Through

Possible Causes

- The knife is not adjusted to cut deep enough.
- The cut stick or cut plates may be worn out.

Solutions

- If not cutting deep enough on the face of the book, adjust the face knife according to instructions in section 4.3.2 Knife Adjustment on page 4-7.
- If not cutting deep enough on the top or bottom faces of the book, adjust the side knives according to section 4.3.2 Knife Adjustment on page 4-7.
- Replace the cut stick or cut plates.

5.8 Book Not Square

Description

The book appears as though it was not cut square.

Possible Causes

- The book was allowed to cool with a twisted binding as shown in Figure 5-8. When the book is straightened after trimming, it looks similar to the book shown in Figure 5-9. This is the most common cause of out of square, especially in a stand-alone trimming application where the binding has had significant time to harden.
- Cover overhangs the book. The overhang reduces the reliability of the squaring process within the trimmer.
- Glue was applied past the binding, leaving a knob-like protrusion. The protrusion interfered with the trimmer's squaring process.
- Normal wear has forced the cutting or transport mechanisms out of square.

Solutions

- Carefully handle books with soft bindings. Keep twist out of the binding when storing. Allow bindings to harden before stacking.
- Cut cover to fall within the size of the untrimmed book.
- Adjust binder such that glue will not be applied past the end of the binding.
- If normal wear has forced the cutting or transport mechanisms out of square, refer the problem to an authorized service agent.

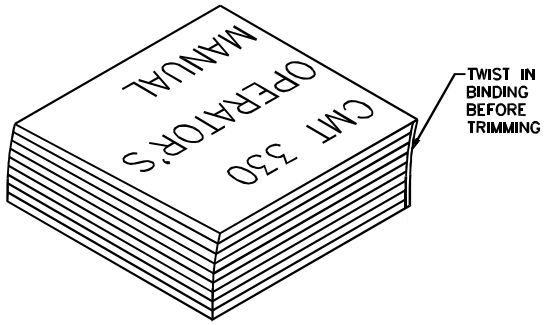


Figure 5-8. Twisted Binding

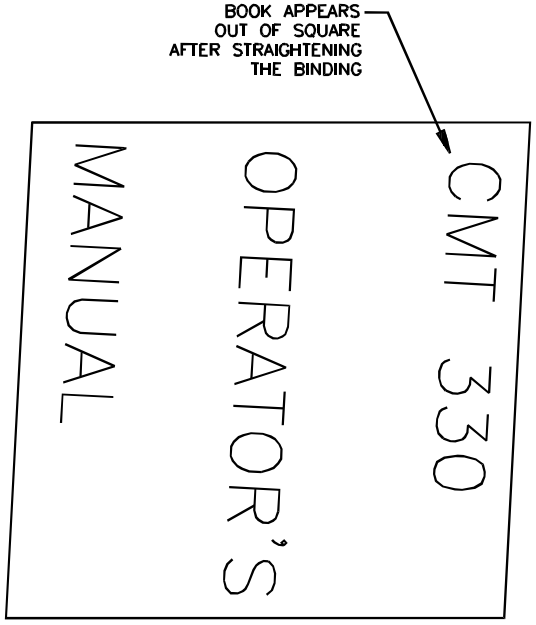


Figure 5-9. Straightened Binding

Notes:

Inch / Metric Conversion Chart

in.	fractional in.	mm
0.016	1/64	0.40
0.031	1/32	0.79
0.047	3/64	1.19
0.063	1/16	1.59
0.078	5/64	1.98
0.094	3/32	2.38
0.109	7/64	2.78
0.125	1/8	3.18
0.141	9/64	3.57
0.156	5/32	3.97
0.172	11/64	4.37
0.188	3/16	4.76
0.203	13/64	5.16
0.219	7/32	5.56
0.234	15/64	5.95
0.250	1/4	6.35
0.266	17/64	6.75
0.281	9/32	7.14
0.297	19/64	7.54
0.313	5/16	7.94
0.328	21/64	8.33

in.	Fractional in.	mm
0.344	11/32	8.73
0.359	23/64	9.13
0.375	3/8	9.53
0.391	25/64	9.92
0.406	13/32	10.32
0.422	27/64	10.72
0.438	7/16	11.11
0.453	29/64	11.51
0.469	15/32	11.91
0.484	31/64	12.30
0.500	1/2	12.70
0.516	33/64	13.10
0.531	17/32	13.49
0.547	35/64	13.89
0.563	9/16	14.29
0.578	37/64	14.68
0.594	19/32	15.08
0.609	39/64	15.48
0.625	5/8	15.88
0.641	41/64	16.27
0.656	21/32	16.67

in.	fractional in.	mm
0.672	43/64	17.07
0.688	11/16	17.46
0.703	45/64	17.86
0.719	23/32	18.26
0.734	47/64	18.65
0.750	3/4	19.05
0.766	49/64	19.45
0.781	25/32	19.84
0.797	51/64	20.24
0.813	13/16	20.64
0.828	53/64	21.03
0.844	27/32	21.43
0.859	55/64	21.83
0.875	7/8	22.23
0.891	57/64	22.62
0.906	29/32	23.02
0.922	59/64	23.42
0.938	15/16	23.81
0.953	61/64	24.21
0.969	31/32	24.61
0.984	63/64	25.00
1.000	64/64	25.40

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